

Wildlife Report

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Lover's Canyon Project

Salmon Scott River Ranger District, Klamath National Forest

Siskiyou County, CA

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WILDLIFE RESOURCE REPORT

Methodology

Methods for analysis focused primarily on assessment of wildlife habitats and habitat distribution. Assessments were made with field review, species surveys, geographic information system (GIS) analysis, and Forest Vegetation Simulator (FVS) plot data collection and modeling.

Field reviews of proposed treatment units were conducted from 2012 thru 2016. Numerous project related field trips occurred early in planning process which included field review of habitat typing, unit design, harvest prescription summary, and unit mark. These field trips focused on discussion of effects on suitable habitat and critical habitat objectives for threatened and endangered species. Project updates presentations took place at Level 1 meetings and District interdisciplinary team presentations on March 17, 2016, April 7, 2016, May 25 & 26, 2016, May 31, 2016, June 2, 2016, July 7, 2016, and September 27, 2016. USDI Fish and Wildlife Service (FWS) personnel were present and contributed input on the June 22, 2016 field trip. Further meetings on proposal development took place with FWS on May 25, 2016, May 31, 2016, August 2, 2016, August 4, 2016, and August 31, 2016.

Northern Spotted Owl (NSO) protocol surveys were conducted each breeding season from 2012 thru 2016. Daytime stand searches in historic activity centers were conducted from 2012 thru 2016.

For this analysis, suitable NSO habitat (nesting, roosting and foraging (NRF)) was identified using the local NSO habitat definition, Spotted Owl Habitat Modeling (USDA Forest Service 1999, Appendix G), application of Suitable Spotted Owl Habitat Definitions using GIS, aerial photography, and ground verification. This resulted in a verified NSO habitat layer that was used for the analysis of effects on NSO. Suitable NSO NRF habitat is used as a proxy to evaluate potential fisher, goshawk, and wolverine reproductive habitat. Other habitat types may be used by these species, especially when occurring as a mosaic with more mature stands, but to include them as a whole may over-represent availability of habitat.

Klamath National Forest (Forest) GIS wildlife and vegetation layers were used to assess habitat for species of concern and management indicator species.

The Forest-wide Late-Successional Reserves Assessment (1999), and the Land and Resource Management Plan (Forest Plan 1995) were used for information on the existing conditions, desired conditions, and Forest policy and guidance.

Current literature from scientific journals and universities was used to support all aspects of the proposed action, current conditions, and the effects section of this report.

Project design measures to minimize negative effects to federally-listed species were developed through interdisciplinary process and discussed with FWS during the Streamlined Consultation Process.

For this analysis, an **activity center** (AC) for NSO is the combined area of the home range and core area; also referred to as an owl 'site'. Habitat analysis includes Federal and private lands.

“Core” or **“core area”** are used interchangeably and these terms are referring to the same area. The core is the area within a 0.5 mile buffer (approximately 500 acres) centered on the most

biologically relevant point (see section “NSO Activity Center Location” for AC placement description).

The **home range** is defined as the area within a 1.3 mile radius from the center of the activity center (e.g. most recent nest site) which would include the core area; for the purpose of this analysis, to explain effects in the core (0 to 0.5 mile) versus effects to the entire home range (0.5 to 1.3 mile), we are using the “core” and “home range” as two separate portions of the activity center.

NSO Habitat Typing

NSO habitat was split into three categories: nesting and roosting, foraging, and dispersal. All other areas are considered non-habitat. Nesting and roosting habitat is generally described as mid- to late-seral forests that contain stands of large trees with high canopy cover, multilayered canopies, and nesting platforms. Foraging habitat is described as having canopy cover less than that of nesting and roosting habitat, less large trees, and enough space for NSO to maneuver through the trees for hunting prey when compared to nesting and roosting habitat. Dispersal habitat contains a moderate level of canopy closure, trees large enough to provide shelter and areas for potential foraging opportunities for traveling NSO. In addition to these biotic features, abiotic features such as slope position and distance to water were also used to determine habitat type.

NSO habitat condition was initially assessed using CALVEG and Remote Sensing Lab data (EVeg) in combination with the Salmon and Scott River Ranger District vegetation GIS layers (combination of on-the-ground habitat assessment and aerial photographs interpreted by district biologist). The habitat type that was determined using the GIS data was validated with on-the-ground sampling that included areas representing NSO habitat and non-habitat.

The on-the-ground habitat assessment used a combination of tools to determine the habitat type. Physical attributes, such as canopy closure, basal area, number of large trees (greater than 26 inches diameter at breast height (DBH) (see the glossary in the environmental assessment for the definition) per acre, and the quadratic mean diameter, were used to determine habitat type. In addition, abiotic factors such as slope position, aspect, and distance to water were also considered during habitat typing. Each treatment unit was transected and the biotic and abiotic characteristics were visually estimated; based on the collection of those habitat characteristics, each treatment unit was assigned a habitat type.

NSO Analysis

The northern spotted owl analysis was split into multiple biologically relevant spatial scales to estimate direct and indirect effects to NSO habitat: 1) critical habitat subunit (landscape scale), 2) analysis area (watershed scale), and 3) home range (individual scale). The habitat analysis estimates the number of acres of habitat affected by the proposed activities within the analysis area. The home range analysis estimates the effects of the proposed treatment on habitat within the NSO core and home range, and resulting effects to NSO. The critical habitat analysis estimates the effects to habitat function within critical habitat that may occur as a result of the proposed activities and lack of such activities.

NSO Habitat Analysis: NSO Habitat was analyzed within the analysis area which includes the area where direct or indirect effects to NSO habitat may occur. Direct or indirect effects to habitat were assessed by estimating the level of change from the known existing habitat quality to the

anticipated post-treatment habitat condition. Current habitat conditions were determined by the methods presented above in “NSO habitat typing.”

In order to estimate the change in habitat resulting from the proposed activities, stand exams, prescriptions, and stand mark were used to assess the level of effects in the treatment units. The stand exams provide current on-the-ground measurements of the habitat in the treatment units and the prescriptions provide a detailed description of the actions proposed for those treatment units. The District biologist reviewed the on-the-ground mark. The combination of these tools provides a quantitative (using FVS from stand exam data) and qualitative assessment of these treatments to determine the level of effects on NSO habitat.

The resulting level of effects to the habitat was determined to be either no effect, degraded, downgraded, or removed. No effect means that the action will not measurably decrease the quality of habitat. **Degrade** means the effects are minimal and the habitat remains functional at the same level prior to treatment. **Downgrade** means the habitat has been affected to the point where the habitat will not continue to function at its initial habitat type and it will drop down one level in habitat type. **Removal** means the habitat prior to treatment will no longer function as NSO habitat. Qualitative and quantitative attributes were considered in this process including the anticipated change in habitat structure after treatment. Not only were FVS modeling predictions used but effects to habitat considered size of parcel treated, homogeneity of the stand conditions pre- and post-treatment, habitat conditions that were adjacent to the areas treated, position on slope and aspect of parcel treated, distribution of untreated riparian areas, and the distribution of leave areas retained to meet Recovery Action RA-32 (from the USDI FWS Revised Recovery Plan 2011b). The culmination of these factors all weighed in the determination of degrade, downgrade, or removal habitat conditions predicted after treatment.

NSO Activity Center Analysis: This analysis will focus on the potential effects to NSO nesting territories by assessing potential effects to habitat at the two spatial scales: 1) home range and 2) nest core. Because the actual configuration of a home range is rarely known, the estimated mean annual home range of a northern spotted owl pair in the California Klamath Province is represented by a 1.3-mile radius circle (3,398 acres) centered upon an the NSO detection; ideally the activity center would be centered on the nest tree. A 0.5-mile radius circle (502 acres) around an owl activity center is used to delineate the area most heavily used (“core area”) by owls during the nesting season.

The amount of suitable habitat within both the home range and core has been shown to influence NSO productivity and survivorship (Franklin et al. 2002; Dugger et al. 2005). Based on results of these studies, the USDI Fish and Wildlife Service has concluded that take is not likely to occur if management activities retain a higher proportion (at least half, or 250 acres) of the core area’s high quality nesting and roosting habitat and 150 acres of foraging habitat (USDI FWS 2009). The home range is recommended to contain at least 250 acres of nesting and roosting habitat and 1,085 acres of foraging habitat to avoid significant effects. These measures for NSO core and home range were used to analyze potential effects of the proposed activities.

NSO Activity Center Location: Activity centers are commonly defined as the area containing a concentrated area of use typically related to nesting but, in some cases, the activity center can include a highly used roost site. NSO are central place foragers which are characterized by individual owls foraging and returning to the nest or roost site. The particular locations of NSO use

aids in delineating an activity center. However, NSO sites can be a general location and not a specific location due to the nature of the survey procedure. The detected NSOs are likely within 0.5 mile given the likely distance the broadcast call would travel. Nest locations, however, can be accurate to the exact nest tree in some situations. Over time, the nest location can move from one tree to another for various reasons, but often within the already delineated core. Since the Lover's Canyon project area has been surveyed for several years, and nest sites and activity center use have been located, the locations of these ACs can be accurately assessed. AC locations were placed on the central location of the survey data and the highest ranked detection. This did result in some AC location shifts in the analysis.

NSO Critical Habitat Analysis: Critical habitat analysis is focused on potential effects to the biologically important features (Primary Constituent Elements) used to identify critical habitat. The critical habitat analysis area was confined to the portion of critical habitat within the analysis area. Only changes to the Primary Constituent Elements as a result of proposed actions were analyzed.

Analysis Indicators

For all terrestrial wildlife species and their habitats, this report considers the direct and indirect effects of the alternatives to individuals, if known, or to potential habitat quantified by acres. Issues identified during public scoping include potential impacts to the northern spotted owl and fisher. For the northern spotted owl, acres of suitable nesting, roosting, foraging, or dispersal habitat modified or improved, degraded, downgraded or removed will be reported. Additionally, acres of designated Critical Habitat will modified or improved, degraded, or lost will be reported. Acres of suitable fisher denning and foraging habitat will be reported. Potential direct and indirect effects to individuals for all alternatives are analyzed for federally-listed species; potential effects to Forest Service Sensitive species are described in the Biological Evaluation. Potential effects to Management Indicator Species (MIS), migratory songbirds, and Survey and Manage species are also described respectively in the MIS Report (Parts I and II), Migratory Songbird Report, and the Survey and Manage Compliance Review.

Effects of the project on late-successional species and their required habitats are the main focus of this analysis. One such late-successional species is the NSO, federally-listed as threatened. Indicators for the NSO include acres of suitable nesting, roosting, foraging, and dispersal habitat potentially affected by the alternatives, and the potential for direct and indirect effects to individuals. NSO nesting, roosting, and foraging habitat will be used as a proxy to estimate goshawk, wolverine, and fisher habitat. Indicators for other species include the acres of suitable habitat potentially affected by the alternatives.

Spatial and Temporal Context

The *treatment area* boundaries reflect the physical project footprint, where proposed vegetation and prescribed fire, and therefore potential direct effects, would occur. *The project area* is described by 7th field watersheds where project is proposed. The *analysis area* varies by species and reflects the area within which the species could be directly and indirectly affected by the proposed action and alternatives. For species with larger home ranges such as northern spotted owl (NSO), goshawk or fisher, the analysis area consists of the treatment areas plus a distance

representing a median home range in the California Klamath Province. Temporal bounding for effects extends out to 30 years following inventory conditions. Treatments are projected in the years 2018 and 2020 with post treatment analysis ending in the year 2042. Stand development was modeled for a 30 year period. That is adequate time in which to display the differences on stand development between treating and not treating stands in the project area. This temporal bound also exceeds Regional Forester direction to incorporate treatments that are effective for at least 20 years.

The **analysis area** was established by a 1.3 mile buffer around all proposed treatment units and the known home ranges. The **critical habitat analysis area** is the portion of the analysis area that overlaps into critical habitat. The **treatment area or treatment unit** is the area where the action will occur. For this analysis, **short term** is defined as the period of time encompassing implementation and the time for the habitat to respond to the treatment defined as up to 10 years after implementation. **Long term** is defined as the time period during stand development 30 years after implementation. Temporal bounding for disturbance effects is narrowed to the time during project implementation when the possibility of disturbance is greatest to NSO.

Affected Environment

The species and habitats that exist in the analysis area are described in this section as listed or proposed threatened and endangered species; Forest Service sensitive species, survey and management species, management indicator species, and migratory birds. Table 1 displays the federally-listed, Forest Service sensitive, and survey and manage species being considered.

Table 1: Federally-listed, Forest Service Sensitive, and Survey and Manage Species in or adjacent to the project area based on known occurrences or presence of suitable habitat

Species	Status	Known to Occur in Analysis Area?	General Habitat Description
Northern spotted owl	Federally listed as Threatened	4 known territories and 2011 designated Critical Habitat	Nests in complex forested habitats with multi-layered canopies, large overstory trees, snags, and downed wood
Gray wolf	Federally listed as Endangered	No known records in project area.	Habitats vary usually avoids areas of concentrated human use.
Bald eagle	Forest Service Sensitive	No known nest sites but have been observed roosting and foraging along the Scott River and the Salmon River	Nests in conifer forests containing old-growth components typically within 1 mile of water
Northern goshawk	Forest Service Sensitive	Two designated goshawk management areas. No known nest sites.	Nests in dense, mid-mature and late successional conifer forests
Willow flycatcher	Forest Service Sensitive	No known locations but small areas of potential riparian habitat occurs along Scott River	Nests in river valleys or lush meadows in willows or other riparian tree/shrub species

Species	Status	Known to Occur in Analysis Area?	General Habitat Description
Wolverine	Forest Service Sensitive and Proposed for Federal Listing	No known locations but species could occur based on available habitat	Use meadows, forests, riparian habitats and montane chaparral; mature, structurally complex high elevation conifer and mixed conifer-hardwood forests
Fisher	Forest Service Sensitive	No known locations but species could occur based on available habitat	Mature, structurally complex conifer and mixed conifer- hardwood forests; require multiple rest sites that are
Pacific marten	Forest Service Sensitive	No known locations; habitat potential is low in the project area	High-elevation true fir stands; use large logs, snags and live trees for denning or resting
Pallid bat	Forest Service Sensitive	No known locations, but occurrence is likely based on available snag habitat; large rocky outcrops, caves or mines are not known within or adjacent to project	Utilizes a variety of arid and or wooded habitats often in association with caves for roosting; will use caves, large trees, mines, buildings and bridges for roosting
Townsend's big-eared bat	Forest Service Sensitive	No known locations, but occurrence is likely based on available snag habitat; caves or mines are not known within or adjacent to project	Variety of wooded habitat often in association with caves for roosting; will use caves, large trees, mines, buildings and bridges for roosting
Fringed myotis	Forest Service Sensitive	No known locations, but occurrence is likely based on available snag habitat; large rocky outcrops, caves or mines are not known within or adjacent	Utilizes a variety of arid and or wooded habitats often in association with caves for roosting; will use caves, large trees, mines, buildings and bridges for roosting
Western pond turtle	Forest Service Sensitive	No known locations but potential habitat occurs along Scott River and mouths of	Aquatic habitats of ponds, lakes, streams; require emergent basking sites; use adjacent terrestrial
Foothill yellow-legged frog	Forest Service Sensitive	No known locations but potential habitat occurs along Scott River	Shallow, slow moving streams with gravel or rocky substrate
Cascade frog	Forest Service Sensitive	No known locations but potential habitat occurs at higher elevations of the project	Montane meadows, lakes, and ponds
Siskiyou Mountain salamander	Forest Service Sensitive, Survey and Manage	Project is within potential range of species. No known records in proposed action	Talus Habitat
Blue-gray tailed dropper	Survey and Manage	Project is within potential range of species. No known records in proposed action	Older forested habitat with hardwood leaf litter
Tehama chaparral snail	Forest Service Sensitive, Survey and Manage	Project is within potential range of species. No known records in proposed action	Talus Habitat

Species	Status	Known to Occur in Analysis Area?	General Habitat Description
Western bumble bee	Forest Service Sensitive	No known locations. No habitat affected	Open wet meadow habitats

Threatened or Endangered Species and Species Proposed for Federal Listing

The Forest accessed the most recent list of species that are endangered, threatened, or proposed for federal listing that may occur in the vicinity of the project from the USDI Fish and Wildlife Service (FWS) web site (IPaC) dated July 21, 2016 and updated on February 23, 2017

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(<https://ecos.fws.gov/tails/extMod/ipacGetDocument!retrieveDocument.action?pdfFileName=/mnt/secure/webdocs/tails/11333/v6270743.pdf>). This information is summarized in Table 2 along with the federal status of the species and of critical habitat.

Table 2: List of threatened and endangered species and species proposed for federal listing

Wildlife Category	Common Name	Scientific Name	Status	Critical Habitat
Crustaceans	Conservancy fairy shrimp	<i>Branchinecta conservation</i>	E	Y
	Vernal pool tadpole Shrimp	<i>Lepidurus packardi</i>	E	Y
	Vernal pool fairy shrimp	<i>Branchinechta lynchi</i>	T	Y
Amphibians	Oregon spotted frog	<i>Ranap pretiosa</i>	T	P
Fish	Shortnose sucker	<i>Chasmistes brevirostris</i>	E	P
	Lost River sucker	<i>Deltistes luxatus</i>	E	P
Birds	Yellow-billed cuckoo	<i>Coccyzus americanus</i>	T	P
	Northern spotted owl	<i>Strix occidentalis caurina</i>	T	Y
Mammals	Gray wolf	<i>Canis lupus</i>	E	N
	North American wolverine	<i>Gulo gulo luscus</i>	PT	N

Status = Threatened (T), Endangered (E), or Proposed (P). Critical habitat = Yes (Y), no (N), or proposed (P).

Critical Habitat for the vernal pool fairy shrimp was designated on August 11, 2005.

Critical Habitat for the shortnose sucker and Lost River sucker was re-proposed on November 21, 2012.

Critical Habitat (revised) for the northern spotted owl was designated on December 4, 2012.

One species that is federally-listed as Threatened is known to occur within the analysis area (**Northern spotted owl**). Other listed species are addressed as follows:

Oregon spotted frog (*Rana pretiosa*) - The areas proposed for treatment are outside of the sub-basins where this species is either historically or currently extant¹, as identified in the Final Rule for Listing (USDI FWS 2014); therefore, there is a discountable chance for it to occur within the project area and this project will have “**no effect**” on this species. It will not be further discussed in this document.

Conservancy Fairy Shrimp (*Branchinecta conservatoria*), **Vernal pool fairy shrimp** (*Branchinecta lynchi*) and **Vernal pool tadpole shrimp** (*Lepidurus packardii*) - The analysis area for this project is outside the range of Conservancy fairy shrimp and vernal pool tadpole shrimp and does not contain suitable habitat for vernal pool fairy shrimp. Therefore, this project will have “**no effect**” on these species.

Yellow-billed cuckoo (*Coccyzus americanus*) – The cuckoo is strongly associated with dense riparian vegetation typically composed of woodlands with low, scrubby, dense vegetation and surface water. In some areas of the species range, the cuckoo can be found in willow thickets or dogwood patches. On the Forest, cuckoo habitat may occur in small areas along the Klamath River but the Forest has no record of a cuckoo detection; the closest known detection is located near the mouth of the Smith River (outside the boundaries of the Forest). However, even if the species did occur in the project area, the Lover’s Canyon project does not contain cuckoo habitat. The project will not modify habitat nor disturb potential nesting cuckoo; thus, the project will have “**no effect**” on cuckoo. In addition, the Forest doesn’t contain any cuckoo critical habitat; thus, this project will have “**no effect**” on proposed cuckoo critical habitat.

The project area is outside the range of the shortnose sucker (*Chasmistes brevirostris*) and Lost River sucker (*Deltistes luxatus*); it is not within these species’ proposed Critical Habitat. The proposed project will have “**no effect**” on the shortnose sucker or Lost River sucker or their proposed Critical Habitat. These species will not be further addressed in this document.

The following wildlife species will be addressed within this document:

Endangered: Gray wolf (*Canis lupus*) – The species was added to the FWS species list for the Forest after the GPS-collared wolf known as OR-7 dispersed from Oregon into California; OR-7 has since returned to Oregon. While OR-7’s dispersal event suggests that unmarked wolves may occur in California without our knowledge, OR-7 was the second recorded wolf in California since 1924. OR-7 was never recorded to have interacted with potential unmarked individuals in California. Additionally, OR-7’s GPS data, although limited due to time span between locations, did travel near the project area. Confirmed detection of the second known gray wolf and wolf pack (Shasta Pack) was recorded near Mt Shasta, more than 50 miles from the project area in fall of 2015. The current location of this pack is unknown. Most recently, a new pair of wolves were confirmed in the Lassen National Forest area (more than 150 miles from the project area). During the summer of 2016 cursory wolf howling surveys were conducted in the Marble Mt. Wilderness, approximately 10 miles from the project area. No wolves were detected in this survey effort.

Threatened: Northern spotted owl (*Strix occidentalis caurina*) and designated **Critical Habitat**

Critical Habitat for the northern spotted owl was designated by the FWS on January 15, 1992. Revised Critical Habitat was designated on December 4, 2012.

Northern Spotted Owl (*Strix occidentalis*)

Current Conditions and Past Influences

The entire project area has had timber harvesting occurring for at least the past 60 years removing many, but not all, of the largest overstory trees. The affected environment includes the effects of the past actions in the project area. In the 1950's the limited timber harvesting that took place generally was a light sanitation/salvage type cut that often removed a few trees per acre but these usually were some of the largest trees. During the 1960's there was an emphasis on regeneration harvesting (clearcutting) along with the fifties style partial cutting. District records indicate about 720 acres of clear-cuts and 800 acres of partial cuts. The clear-cuts were planted to ponderosa pine of unknown seed source. In the 1970's another 1,400 acres were treated implementing the partial removal prescription. An additional 100 acres were regeneration harvested as well. In the 1980's timber sales created both regeneration harvest units, about 400 acres, in the project area and involved more partial cutting on another 700 acres. There was a return to partial cutting in the 1990's and approximately 2,200 acres received partial cutting with an improvement cut prescription. Hence, all stands in the current proposal have had some level of past harvesting take place in them at least once. Except for the regeneration cuts all the other past logging focused on removal of the larger trees in the stands with limited weeding and cleaning or pre-commercial thinning to remove undesirable sub-merchantable stems. The end results for the project area are 30- to 200-year old trees with the vast majority of the original overstory removed. Excluding conifer plantations, average tree ages in the areas recommended for treatment are in the 90 to 120 year range. Moderate ground fuel accumulations exist, and overstocked sapling to small saw timber sized stems are found throughout.

The majority of the natural stands receiving treatment in the Lover's Canyon Project are primarily located in the Canyon and Boulder Creek drainages. There are some treatment stands in both the Kelsey and Boulder creek drainages. Plantations to be treated are scattered across the entire project area. The elevation band for the project area is 2,400 to 5,500 feet. The composition of the vegetation is influenced in part by the elevation. At the upper elevations (generally above 5,000 feet) forested stands are white fir dominated. Below 5,000 feet these stands blend into the mixed conifer timber type. White fir becomes less dominant as elevation decreases. At the lower elevations (generally below 4,500 feet) the forest type is mixed conifer. Aspect strongly influences stand composition with Douglas-fir and white fir dominating the north and east facing slopes. The pine species, incense cedar and Douglas-fir are more commonly found on the south and west facing aspects. In the absence of naturally occurring low intensity wildfires, white fir has significantly increased in magnitude and distribution. There have been no significant wildfires in the project area for the past 100 years; however, in 2014 the Happy Camp Complex fire burned a large portion of the landscape near the project area and came into the project boundary on the northwest side. The Happy Camp Complex fire had very little impact on the project area itself,

only spotting into a few small areas; however, this fire did have a landscape level impact on the west side of the Forest.

NSO Habitat Type

Northern spotted owls generally inhabit older forested habitats because they contain the structures and characteristics required for nesting, roosting, foraging, and dispersal (Forsman et al. 1984, Blakesley et al. 1992, LaHaye and Gutiérrez 1999). Specifically, habitat features that support nesting and roosting include a multi-layered, multi-species canopy dominated by large overstory trees; moderate to high canopy closure (60 to 90 percent); a high incidence of trees with large cavities or other types of deformities (e.g., broken tops, mistletoe, etc.); numerous large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for NSOs to fly within (Thomas et al. 1990). Basal areas within nest stands often exceed 200 square feet per acre (Solis and Gutiérrez 1990). Foraging habitat generally consists of attributes similar to those in nesting and roosting habitat, but variation of foraging habitat exists over the NSO range. In the analysis area, NSO likely forage in a variety of seral conditions that may include the presence of hardwood understory. Dispersal habitat, at minimum, consists of stands with adequate tree size and canopy closure (greater than or equal to 40 percent) to provide protection from avian predators and some foraging opportunities (USDI FWS 1992).

NSO habitat is also influenced by abiotic features (i.e., slope position, distance to water, and topography) in determining the habitat type: nesting, roosting, foraging, and dispersal (Solis and Gutiérrez 1990, Blakesley et al. 1992, LaHaye and Gutiérrez 1999). Studies from northern California indicate that NSOs typically nest and roost on the lower 2/3 of slopes within a given drainage (Forsman et al. 1984, Blakesley et al. 1992, Hershey et al. 1998) while avoiding the upper 1/3 of slopes (Blakesley et al. 1992). Upper ridgelines are generally considered to be natural barriers which can separate NSO home ranges; NSO likely don't forage on the opposite side of a ridgeline from their home range (Forsman et al. 1984).

A recent synthesis of published and unpublished literature on NSO habitat use and home range composition outlines the range of measurable habitat conditions and abiotic factors (slope position, distance to water, etc.) strongly associated with NSO nesting, roosting, or foraging use in the northern California interior (USDI FWS 2009). The USDI Fish and Wildlife Service has classified this range of conditions into habitat categories based on the conditions' primary function and apparent quality for NSO (nesting and roosting or foraging habitat, high or low quality habitat; Table 3).

Table 3: Values for selected structural parameters used in the Fish and Wildlife Service guidelines to classify nesting and roosting, and foraging habitat for northern spotted owls.

Habitat category	Tree Size (QMD) ¹	Basal Area ²	Trees Greater than 26 inches dbh	Canopy closure
High nesting/roosting	≥ 15"	≥ 210 ft ²	8 per acre	≥ 60%
Nesting/roosting	≥ 15"	150-180+ ft ²	8 per acre	≥ 60%
Foraging	≥ 13"	120-180+ ft ²	5 per acre	Mix ranging ≥ 40-100%
Low foraging	≥ 11"	80-120+ ft ²	< 5 per acre	≥ 40%

¹Quadratic Mean Diameter (inches) of trees > 5" diameter; ² Square feet per acre, trees > 5"

In 2011, NSO habitat on the Forest was estimated as 180,918 acres of nesting or roosting and 383,536 acres of foraging habitat. Recent estimates of nesting and roosting and foraging habitat was reduced (outside the project area) by the Goff Fire (2012), Salmon Complex Fire (2013), and the Whites Fire (2014).

Wildfire Effects to Habitat Baseline - For this analysis, the analysis area for NSO extends beyond the project area and into a portion of the landscape that burned in the Happy Camp Fire 2014. Approximately 3,000 acres of the analysis area was burned at varied intensity. The fire and related suppression actions resulted in effects to NSO habitat. The post-fire habitat changes in habitat from the Happy Camp wildfire and suppression actions were accounted for in the base habitat layer for the Lover's Canyon Project habitat analysis.

Table 4: Distribution of Nesting/Roosting, Foraging, Dispersal and non-habitat in the Lover's Canyon Analysis Area (acres include Federal and private lands)

Habitat Type	Analysis Area
Nesting/Roosting	4,249
Foraging	10,496
Post-fire Foraging (PFF)	283
Dispersal	4,068
Non-Habitat	7,809
Total	26,905

Suitable NSO Habitat

Effects of past actions on habitat have resulted in some habitat loss and degradation. Since the analysis area has higher soil site quality, affected habitat has experienced some habitat recovery and enhancement.

Nesting/Roosting Habitat - Within the analysis area, the existing 4,249 acres of nesting and roosting habitat is well distributed in the mid and lower elevation slopes. The southern portion of the analysis area has large patches in the wilderness. Large patches of NR habitat also occurs along the Scott River. Historic fire histories on the Scott River area have resulted in characteristically uncommon nesting/roosting habitat conditions on the upper 1/3 of slopes.

Foraging Habitat - Foraging habitat is common throughout the project area. Nearly half of the analysis area contains foraging habitat but the quality of the habitat varies. Snags and coarse woody debris are abundant in the foraging habitat.

Northern spotted owls feed mainly on small forest mammals, particularly arboreal and semi-arboreal species (Courtney et al. 2004). Northern flying squirrels and woodrats comprise a bulk of the diet, but secondary species may be important for survival and reproduction. Deer mice, red tree voles, red-backed voles, and two species of lagomorphs (rabbits and hares) are considered important in the diet (Courtney et al. 2004). Despite several strategic red tree vole surveys on the Forest, this species has not been detected on Scott and Salmon River Ranger District which includes the Lover's Canyon project area. From the list of potential prey species (flying squirrels,

woodrats, red-backed voles, cottontail rabbit, and deer mice) that may occur in the analysis area, we expect woodrats to be the most important and available prey species for NSO.

Dusky-footed and bushy-tailed woodrats likely occur in the analysis area. Dusky-footed woodrats are nocturnal, arboreal herbivores that are a major prey species for owls below 4,100 feet. Generally, dusky-footed woodrat densities appear to follow stages influenced by habitat quality. The progression follows as: unsuitable habitat (recently burned clearcuts), to optimal habitat (sapling/bushy pole timber 15 to 40 years old and young redwood forest five to 20 years old), then a gradual decline to marginal habitat (small and large saw timber stands, intermediated-aged forests) with a possible second peak in abundance in old forest as openings form in the canopy structure creating patches of stable, bushy understory (Sakai and Noon 1993, Courtney et al. 2004). Optimal habitats for bushy-tailed woodrats are rock outcrops associated with coniferous forests, montane riparian, montane chaparral, and alpine dwarf-shrub. Other preferred habitats include montane hardwood-conifer, Douglas-fir, redwood, red fir, Jeffrey pine, and subalpine conifer (Brylski 2008). Distribution and abundance seem to be limited largely by availability of shelter. Dens are made of sticks, foliage, and debris and are built at the entrance to crevices, caves, and in forks of trees (Brylski 2008).

Dispersal Habitat - The distance between adjacent pairs or groups of breeding northern spotted owls should be such that the dispersal of juveniles can replace losses among existing pairs and provide for the colonization of suitable, unoccupied habitats. Thomas et al. (1990) suggest that management practices, such as visual corridors, riparian corridors, streamside management zones, geologic reserves, and other special management zones, provide habitat attributes conducive to northern spotted owl dispersal between habitat areas. To facilitate dispersal between habitat patches, Thomas et al. (1990) suggest maintaining 50 percent of each quarter-township in forest crown closure over 40 percent with average diameter at breast height of 11 inches.

Dispersal habitat (4,068 acres) (excluding nesting/roosting and foraging habitat) across the Lover's Canyon Project analysis area is patchy and is influenced by geology, past fire and past timber harvest. Dispersal habitat is provided in stands with trees larger than 11 inches diameter at breast height and greater than 40 percent canopy closure. In the analysis area, dispersal habitat is distributed within riparian reserves, geological reserves, visual corridors, untreated areas, and nesting, roosting, and foraging habitat. Dispersal opportunities are not limiting.

Post-Fire Foraging Habitat (PFF) – a small degree of PFF habitat occurs in the northern portion of analysis area. This habitat is considered to provide foraging opportunities even though it was influenced by recent fires.

Non-Habitat – Non-habitat is represented by younger plantations, meadows and non-forest vegetation. Although these areas may provide some edge foraging habitat when they occur next to suitable habitat, non-habitat is not considered in the habitat analysis for this project.

Potential barriers to dispersal for late-successional forest-related species would include large areas that currently do not support late-successional or mid-successional forest. The surrounding landscape is characterized by a forest influenced by past fire history, timber harvest, and natural fragmentation. In the analysis area, there is an estimate of 7,809 acres of non-habitat areas composed of plantations, small meadows and early seral habitat. These areas of non-habitat are distributed throughout the analysis area and may provide some limitation to NSO dispersal.

opportunities. This is most notable in the southeast portion of the analysis area (south west of Blue Ridge Lookout) where fire history and past timber harvest have reduced dispersal opportunities.

Vegetative corridors still exist and older plantations are maturing to be able to provide for future dispersal potential in that area.

Exclusion of fire in portions of the project area has resulted in changes to forest structure and species composition. Fire suppression has changed the fire regime from frequent low intensity surface fires to infrequent, but potentially devastating, stand-replacing fires. The results of these conditions include increased susceptibility to disease, increases in dead and live fuel, development of ladder fuels, and a more dense forest with a closed canopy that can sustain a crown fire. These conditions create the potential for large-scale loss of dispersal habitat to wildfire which could result in barriers to dispersal.

NSO Distribution in the Analysis Area

The Lover's Canyon Project analysis area contains 10 known NSO activity centers; all of these have portions of their home ranges that overlap with proposed activities and may be affected by the proposed action. These activity centers were originally identified as early as the early 1980s.

NSO Survey Summary

Surveys for NSO were conducted at various times in the Lover's Canyon Project area since the 1980s. More recently, however, surveys were completed to interim guidance protocol standards (2011a) in the Lover's Canyon Project analysis area in 2012 through 2016 and included all suitable NSO habitat and activity centers within 1.3 mile of proposed treatment units. Findings from these recent surveys have confirmed NSO activity at five of the 10 historical sites within the analysis area while the remaining five sites have had no NSO detections based on the recent 2012-2016 survey effort.

Between 2012 and 2016 no reproduction was documented; however, single owls and non-reproductive pairs were recorded in association with activity centers KL0248, KL4095, KL0247, KL0096B, and KL0094 (Table 5). Based recent NSO detections this analysis shifted two NSO activity centers based on areas of recent detections that are located slightly outside of the historic territory areas (KL0248 shift and KL0094 shift).

Table 5: Affected NSO Activity Centers and status (based on protocol surveys) within the Lover's Canyon Analysis Area

Activity Center Number	Activity Center Name	Highest Historical Status (prior to 2012)	Recent Status (2012 – 2016)
KL0094 Shift	Boulder Creek	Reproductive Pair 1992	Non-Reproductive Pair 4/20/13 Single Male 7/5/13
KL0096	North Kelsey	Non-Reproductive Pair 1991	No Responses 2012-2016
KL0247	Main Kelsey	Reproductive Pair 1998	Single Male 5/19/12
KL0248 Shift	Lovers Camp	Non-Reproductive Pair 1997, 1993, 1991	Single Male 5/23/12 Single Male 7/24/12 Single Male 6/15/13 Single Male 6/29/13 Single Male 3/21/15 Single Male 7/28/16 Single Male 6/26/16 Single Male 7/9/16 Single Male 7/16/16
KL0298	Buker	Non-Reproductive Pair 2001, 2000, 1993	No Responses 2012-2016
KL0353	Deep Creek	Reproductive Pair 1998	No Response 2012-2016 (Nearby responses associated with KL0248)
KL4085	Canyon Creek	Reproductive Pair 1998	No Responses 2012-2016
KL4095	South Kelsey	Single 2001	Non-Reproductive Pair 7/8/12 Non-Reproductive Pair 5/8/16
KL4097	North Kelsey	Non-Reproductive Pair 1987	No Response 2012-2016
KL0096B	New Lovers	Non-Reproductive Pair 1991	Non-Reproductive Pair 5/14/14

*No barred owls have been documented in the Lover's Canyon Analysis Area. Barred owl specific surveys were not conducted in the project area.

Home Range and Core NSO Habitat Summary

Site occupancy and reproductive rates have been shown to exhibit substantial annual variation that may be influenced by individual owl's site fidelity, climatic extremes, shifts in prey availability, or presence of other raptors (Loschl 2008, Olson et al. 2005). Results of the surveys for this project illustrate this variation and suggest that five core areas in the analysis area are not currently occupied. No NSO have been detected in the once occupied KL0094, KL0298, KL4085, and KL1085 over the last five years of surveys. No home ranges are below the 1,336 habitat threshold. All core areas are below the 500 acre habitat threshold except for the core for KL0353 (Table 6).

Table 6: Current NSO habitat in home range and core of activity centers

Activity Center Number	Activity Center Name	F in the core	NR in the core	Total NRF in the core	F in the home range	NR in the home range	Total NRF in the home range
KL0094 Shift	Boulder Creek	381	80	461	2,182	540	2,722
KL0096	North Kelsey	319	4	323	1,508	621	2,129
KL0247	Main Kelsey	128	209	337	1,224	269	1,493
KL0248 Shift	Lover's Camp	166	164	330	1,841	960	2,801
KL0298	Buker	395	0	395	2,111	458	2,569
KL0353	Deep Creek	452	50	502	2,016	1,020	3,036
KL4085	Canyon Creek	139	306	445	1,098	1,234	2,332
KL4095	South Kelsey	269	59	328	1,746	300	2,046
KL4097	North Kelsey	273*	42	315*	1,372*	186	1,558*
KL0096B	New Lovers	102	268	370	1,370	853	2,223

* contains forage and some post-fire forage habitat

Barred Owls

Barred owl-specific surveys have not been conducted for this project. No barred owls have been detected during recent NSO surveys. The closest barred owl detection was in the Singleton Project approximately 15 miles north east of Lover's Canyon area.

Critical Habitat

The California Klamath Province is considered a 'fireprone' province because of its fire return intervals and existing condition (USDI FWS 2011b and 2012). Within fire-prone areas, resource agencies planning vegetation management in Critical Habitat for the NSO are encouraged to ameliorate current threats of on-going habitat loss from uncharacteristic fires and vegetation change due to past fire exclusion (USDI FWS 2011b and 2012). Resource agencies are also encouraged to work toward maintaining or enhancing the characteristics of older forest and provide large habitat blocks and associated interior forest conditions. Regional variations should be taken into account; in the Klamath Province this means providing mosaics of interior habitats and edges to provide for the diversity of prey for NSO.

The Lover's Canyon Project is located within the Klamath West (KLW) Critical Habitat Unit 9. This unit was divided into subunits. The KLW-8 subunit has special management considerations to enhance or protect existing essential biological or physical features and reduce the loss of habitat to wildfire and the change in habitat as a result of fire exclusion. The Lover's Canyon Project analysis area has experienced wildfires and prescribed fires which may have reduced overall levels

of fire risk. In order to promote the development of high quality NSO habitat and provide a longer term of lower fire risk, stands of diseased trees need treatment.

Primary Constituent Elements (PCEs) are the physical and biological features that provide the essential life history requirements of the species. The 2012 Critical Habitat Unit (CHU) designation identifies the primary constituent elements for NSO as those physical and biological features that support nesting, roosting, foraging, and dispersal. Specifically the PCEs for the NSO are summarized from USDI Fish and Wildlife Service 2012:

1. *Forest types that support the northern spotted owl across its geographic range. Within the Klamath Province, these include mixed conifer/mixed conifer-hardwood, mixed evergreen, Douglas-fir, white fir, and Shasta red fir. These forest types may be in early-, mid- or late-seral stages.*
2. *Nesting, roosting, and*
3. *Foraging and Post-fire Foraging habitat.*
4. *Dispersal habitat.*

Table 7: Acres of NSO Critical Habitat within the analysis area

Habitat Type	Acres of Critical Habitat in Analysis Area
Nesting/Roosting	1,878
Foraging	5,763
Post-fire Foraging	82
Dispersal	736
Non-habitat	2,686
Total	11,144

NSO Recovery

Background - A Recovery Plan for the NSO was prepared by a Recovery Team consisting of Federal agencies, State governments, and other interested parties. The Recovery Plan was published in May 2008 (USDI Fish and Wildlife Service, 2008) and revised June 28, 2011 (USDI Fish and Wildlife Service, 2011a). This replaced the 1992 Draft Recovery Plan, which had been used as a foundation for the 1994 Northwest Forest Plan (USDA USDI 1994).

The 2011 Revised Recovery Plan incorporates portions of the 2008 Recovery Plan, modifies or updates other portions based on new information, and builds on previous range-wide conservation plans. The most important range-wide threats to the northern spotted owl include competition with barred owls and the loss of suitable habitat. The 2011 Revised Recovery plan describes a Recovery Strategy which includes addressing threats from barred owls, habitat conservation and active forest restoration as necessary. The California Klamath Province is identified as one province most at risk due to effects of fire exclusion on vegetation change, and habitat loss from wildfire. Specific to dry forest ecosystems such as the California Klamath, the intent of the 2011 Recovery Plan is to “embed spotted owl conservation and recovery within broader dry forest ecosystem restoration efforts to increase the likelihood spotted owl habitat will remain on the landscape longer and

develop as part of this fire adapted community instead of being consumed by uncharacteristic wildfires.” Included in this Recovery Strategy are specific Recovery Actions that land management agencies in the California Klamath Province can implement to contribute to recovery (Table 8).

Table 8: Recovery Actions Applicable to the Lover’s Canyon Project

Recovery Action	Description	Applicable Recommendations
10	<i>Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population</i>	Intent of this recovery action is to protect, enhance, and develop habitat in the quantity and distribution necessary to provide for the long-term recovery of spotted owls. <i>Action: There will be no significant changes to high quality habitat in the ten home ranges in the Lover’s Canyon Project analysis area. RA 10 analysis was conducted and incorporated into the project preferred alternative. No nesting roosting habitat will be commercially treated.</i>
32	<i>Federal and non-federal landowners should work with the Service to Maintain and restore older and more structurally complex multi-layered conifer forests allowing for other threats, such as fire and insects to be addressed by restoration management actions.</i>	Maintaining forests with older, structurally complex, high-quality habitat (defined as nesting roosting habitat in this document) will provide additional support for reducing key threats faced by NSO; protecting these forests should provide NSO high-quality refugia habitat from negative competitive interactions with barred owls that are likely occurring where the two species’ home ranges overlap. <i>Action: High quality spotted owl habitat stands meeting the intent of RA-32 have not been proposed for treatment. No commercial harvest will occur in NSO nesting roosting habitat. No commercial harvest will occur in 100 acre LSRs. Harvest treatment prescriptions will incorporate well distributed skip areas. Commercial harvest treatments within high priority home ranges will incorporate 25% skips in each unit. The remaining commercial harvest treatments will incorporate 15% skips in each unit.</i>

Forest Service Sensitive Species

The Forest Service, Region 5, Sensitive Species list was provided by the USDA Pacific Southwest Region on July 3, 2013, and updated for the Klamath National Forest (Forest) on September 9, 2013. This Biological Evaluation addresses the following species from the updated list:

- Bald eagle (*Haliaeetus leucocephalus*)
- Northern goshawk (*Accipiter gentiles*)
- Great gray owl (*Strix nebulosa*)(+)
- Willow flycatcher (*Empidonax trailii*)
- Greater sandhill crane (*Grus canadensis tabida*) (+)
- North American wolverine (*Gulo gulo luscus*)
- Fisher (*Martes pennanti pacifica*)
- Pacific marten (*Martes caurina*)
- Pallid bat (*Antrozous pallidus*)
- Townsend’s big-eared bat (*Corynorhinus townsendii*)
- Fringed myotis (*Myotis thysanodes*)

- Western pond turtle (*Emys marmorata*)
- Foothill yellow-legged frog (*Rana boylei*)
- Cascade frog (*Rana cascade*)
- Southern torrent salamander (*Rhyacotriton variegates*) (+)
- Siskiyou Mountain salamander (*Plethodon stormi*)
- Tehama chaparral snail (*Trilobopsis tehamana*)
- Western bumble bee (*Bombus occidentalis*)

(+) The Lover's Canyon Project is not within the range of southern torrent salamander (streams within coastal forests) or great gray owl. Habitat for the greater sandhill crane (wetlands, marshes, grasslands, or irrigated fields) does not occur in the project area. These species will not be addressed further in this document.

Bald Eagle (*Haliaeetus leucocephalus*)

Nesting territories are usually associated with lakes, reservoirs, rivers, or large streams and are usually within two miles of water bodies that support adequate food supply (Lehman 1979). Bald eagle nests are usually located in uneven-aged, multi-storied stands with old-growth components (Lehman 1979). Most nests in California are located in ponderosa pine/mixed conifer stands and nest trees are most often ponderosa pine (Polite and Pratt 1999). Bald Eagles are common during migration and in winter along major river systems such as the Klamath, Scott and Salmon Rivers, and in agricultural areas such as Scott Valley. Nine nest sites and four roost sites are known to occur on the Forest. Five nest sites are on the westside of the Forest and the remaining sites are on the eastside.

No known nest sites occur within or immediately adjacent to the project activities. The closest known bald eagle nest sites to the project are at mouth of the Scott River and Quart Valley, both approximately 10 miles from proposed project.

Northern Goshawk (*Accipiter gentilis*)

The goshawk is a forest hawk associated with late successional forest, or with mid-successional forests with late successional elements, in mixed conifer or true fir habitat types. Foraging habitat is variable and includes mid- and late-successional forest, natural and man-made openings, and forest edges. Moderate and high quality habitats contain abundant large snags and large logs for prey habitat and plucking posts (Woodbridge and Detrich 1994). Goshawks generally breed in older-age coniferous, mixed, and deciduous forest habitats. This habitat provides large trees for nesting, a closed canopy for protection and thermal cover, and open spaces allowing maneuverability below the canopy (Woodbridge and Detrich 1994). Forest stands containing nests are often small, approximately 25-250 acres (Woodbridge and Detrich 1994); territories may contain one to five alternative nest areas. In Northern California, maximum distance between alternative nest stands was about one mile, and approximately 85 percent of alternate nest stands were less than 0.5 mile apart (Woodbridge and Detrich 1994).

Timber harvest is a primary threat to nesting populations (Woodbridge and Detrich 1994). Nests can be destroyed by harvest activities and harvest methods that create large areas of reduced forest canopy cover may be especially detrimental. In California, nesting densities remained fairly high

despite fragmentation of mature forests through timber harvest (Woodbridge and Detrich 1994); however, territories associated with large contiguous forest patches were more consistently occupied compared to highly fragmented stands. Timber harvest activities near nests can cause abandonment.

On the Forest, habitat consists of mid- and late-successional mixed conifer forest with scattered harvested and natural openings. Many of the known goshawk sites on Scott River, Salmon River and Oak Knoll Districts are associated with northern spotted owl sites and goshawks were found incidentally while surveying for owls. Therefore suitable goshawk habitat, for this analysis, is considered the same as late- successional habitat defined for spotted owls above. Foraging habitat is variable and includes mid- and late- successional forest, natural and man-made openings, and forest edges.

Approximately 69 goshawk activity centers are mapped on the Westside of the Forest. Four known territories occur within the project's goshawk analysis area; these were designated as Goshawk Management Areas (GMAs) under the environmental impact statement for the Forest Plan (USDA 1994).

For the purpose of this analysis, the analysis area chosen for the goshawk is the same as used for the NSO, recognizing the goshawk use area may be slightly smaller. Approximately 5,028 acres of suitable habitat occur in the analysis area. Within the project area, the overall distribution of late-successional forest habitat is limited but has similar to historic patterns, but the overall amount of been reduced through wildfire, timber harvest, fire salvage and road building on both public lands. Stands that have been burned or harvested, for the most part, are in early or mid-successional forest stages and are capable of becoming late-successional forest habitat in the future. Two Goshawk Management Areas (GMA) occur within the analysis area (GMA SCR #7 and SCR#15).

Willow Flycatcher (*Empidonax virescens*)

The willow flycatcher is a "rare to locally uncommon" summer resident in wet meadow and montane riparian habitats at 2,000 to 8,000 feet in the Sierra Nevada and Cascade Range. In California, this species most often occurs in broad, open river valleys or large mountain meadows with lush, high-foliage volume willows (Gaines 2005). Across its range, willow flycatchers typically select willow for nesting but may use other species of shrubs, typically close to ground in low shrubs and bushes near water.

Habitat for willow flycatchers is primarily located along the Klamath River and high elevation meadow of the Marble Mountain Wilderness. No significant areas of suitable habitat are known to occur within the project area. Surveys have not been conducted for willow flycatchers specifically for the Lover's Canyon Project. For the past 14 years willow flycatchers have been captured at the Constant Effort Mist Netting Station in willow habitat along the Klamath River near Seiad Valley. Breeding adults have been captured in the spring and young of the year have been captured in the fall, indicating that the species likely breeds in the upper basin of the Klamath River and in areas of the Marble Mountains and Siskiyou Crest. This mist-netting station is about 20 miles from the Project Area.

North American Wolverine (*Gulo gulo luscus*)

Sightings of this species are rare in Northern California; sightings range from Del Norte and Trinity Counties east through Siskiyou and Shasta Counties, and south through Tulare County.

Habitat distribution in California is poorly known for the North Coast and northern Sierra Nevada. In northern California, wolverines range from 500 to 1,500 meters in elevation (1,600 to 4,800 feet) in Douglas-fir and mixed conifer and true fir habitats (Johnson 1990). Camera stations and track plate surveys have been conducted on the Forest but these surveys did not find wolverines. There are ten documented detections of wolverines on the Forest but no den sites are known. Surveys for wolverines have not been conducted within the project area. Due to habitat fragmentation and limited availability of older forest conditions, wolverines are not expected to be abundant in the project area. They may be present in the project area.

Fisher (*Martes pennanti pacifica*)

Fisher habitat distribution occurs from Del Norte and Trinity counties east through Siskiyou and Shasta Counties and south through the Sierra Nevada to Tulare County (Ahlborn 1990a).

In a compilation of published and unpublished fisher literature from South-Central British Columbia, Western Washington, Western Oregon, and California, fishers are found to be associated with habitats containing moderate to dense forest canopy in low and mid-elevational areas; home ranges include mosaics of different vegetation types and forest age classes with complex forest structure for denning, resting, and foraging (Lofroth et al. 2010). Some home ranges throughout the range were positively associated with the presence of younger successional stages which likely provide source habitat for fisher prey. In evaluation of fisher resting site selection in three study areas including the Klamath Mountains, Buskirk and others (2010) found when compared to random sites, fishers selected areas with mesic (balanced) moisture and temperature regimes, higher vegetation cover, steeper in slope, and contained a relatively high basal area of conifers, hardwoods, and snags, and relatively large diameter conifer and hardwoods. One study located on the Trinity River, California, use areas appeared to be negatively associated with non-forested or open shrub habitats (as reviewed in Lofroth et al. 2010).

While home ranges may contain mosaics of different vegetation types and age classes, this species is highly associated with large live and dead trees and structural features. Fishers are known to use multiple rest trees in their home range and typically are located in large live trees with some form of deformity such as mistletoe, avian or mammal platform nests, and cavities. Den sites on average to be 1.7-2.8 times the diameter of other available trees within the vicinity; in Northern California den sites are commonly located in hardwoods (in Lofroth et al. 2010). Fishers on Hoopa Tribal Lands and on the Shasta Trinity National Forest were found to use both conifers and hardwoods; black oak trees were used more than expected at both study areas and the fishers selected sites made up of stands with large diameter trees and dense canopy cover; these sites were generally situated in drainage-bottoms (Yeager 2005). Similar findings are reported by others for northern California and southern Oregon (Lofroth, et al. 2010). In mixed conifer habitats similar to Lover's Canyon Project, Thompson et al. (2011) found fishers often in areas with high numbers of small (<20" dbh) trees, and along lower portions of north facing slopes in the Sierra Nevada range. Diet varies across the range, but in Northern California, small mammals comprise the majority of the fisher diet (Golightly et al. 2006).

General surveys have been conducted on the west side of the Forest using baited trip cameras and baited 35mm camera stations; positive detections have been made at many of the stations on Scott River, Oak Knoll and Ukonom Districts. An on-going fisher genetic study on federal and non-federal ownerships to the east and southeast of the Project Area has detected numerous fisher.

Incidental sightings of fisher have also occurred on the Forest for the most part along major roads and highways associated with rivers or large creeks, but no den sites have been located. Most detections on or adjacent to the Forest have been located in mid-late seral true fir, mixed conifer and mixed conifer-hardwood habitats (Farber and Criss, unpublished data. 2006, Farber and Franklin, unpublished data 2005, Yaeger, pers. comm. 2011).

NSO nesting and roosting habitat is considered as a proxy for high quality fisher denning and resting habitat because of the presence of large trees, denser canopy closure, and structural complexity. While canopy closure may be more open than that found in NSO nesting and roosting habitat, NSO foraging habitat is also considered as a proxy for suitable fisher foraging habitat because of the presence of large trees and proximity to higher quality stands. About 260,200 acres of suitable denning and resting habitat and about 260,000 acres of lower quality habitat (NSO 'foraging') for the fisher occur on the Forest. The analysis area includes about 4,249 acres of denning and resting habitat and 10,779 acres of suitable foraging habitat (total 5,028 acres). This foraging value may be an underestimate; additional forested stands dominated by small diameter trees or are considered too dense for owls to fly through were not included in classification of suitable NSO habitat in the analysis area but may still be suitable for fisher foraging, especially along edges of, and when intermixed with mid- and late-successional stands.

American Marten (*Martes americana*)

This species uses mature and old growth forest habitats, typically distributed at a higher elevation than the fisher. Generally, mature and over-mature true fir, hemlock, or pine habitat occurring above 5,000 feet in elevation with a dense canopy (greater than 40 percent) and adequate large, coarse woody debris is considered marten habitat (Ahlborn 1990b). In our area, martens are limited to conifer-dominated forests and vegetation types nearby. In most studies of habitat use, martens were found to prefer late- successional stands of mesic coniferous forest, especially those with complex physical structure near the ground (Buskirk and Powell 1994). Xeric forest types and those with a lack of structure near the ground are used little or not at all. The preference and apparent need for structure near the ground, especially in winter, appears universal (Ruggiero et al. 1994). The marten is predisposed by several attributes to impacts from human activities, including: its habitat specialization for mesic, structurally complex forests; its low population densities; and its low reproductive rate for a mammal of its size (Ruggiero et al. 1994).

The distribution of marten on the west side of the Forest is not well known due to the lack of adequate survey data. Surveys for forest carnivores have been described above (see fisher); marten have not been detected at any of the survey stations to date. Incidental sightings of marten have been recorded on the Salmon River District. Positive detections at camera survey stations on the Goosenest Ranger District of the Forest have found marten using true fir habitats near 7,000 feet in elevation.

Martens are considered as an uncommon to common permanent resident of California North Coast regions and Sierra Nevada, Klamath, and Cascades Mountains. Optimal habitats are various mixed evergreen forests with more than 40 percent crown closure, large trees and snags. Important habitats include red fir, lodgepole pine, subalpine conifer, mixed conifer, Jeffrey pine, and eastside pine. On the Forest, marten have been observed in higher elevations, typically within true fir, lodgepole pine, and subalpine conifer stands.

For the purposes of this analysis, NSO habitat above 5,000 feet is considered as suitable habitat for martens. Standards and Guidelines for both species require retaining canopy cover and retaining large down logs and snags; 144,466 acres of marten habitat is estimated to occur on the Forest. Suitable NSO nesting, roosting and foraging habitat is used as a proxy to evaluate potential marten habitat where it occurs above 5,000 feet. There is an estimate of 6,055 acres of marten habitat in the project area.

Pallid Bat (*Antrozous pallidus*)

The pallid bat is a California Species of Special Concern and Forest Service Sensitive. Throughout California the pallid bat is usually found in low to middle elevation habitats below 6,000 feet; however, the species has been found up to 10,000 feet in the Sierra Nevada. Populations have declined in California within desert areas, in areas of urban expansion, and where oak woodlands have been lost. This species, like many other bats, is extremely sensitive to disturbance at roosting and nesting sites.

A variety of habitats are used, including grasslands, shrublands, woodlands, and coniferous forests. Pallid bats are most common in open, dry habitats that contain rocky areas for roosting. They are a yearlong resident in most of their range and hibernate in winter near their summer roost (Harris 1990a). Occasional forays may be made in winter for food and water. Pallid bats are unusual in that most of their food consists of large insects captured on the ground

Day roosts may vary but are commonly found in rock crevices and tree hollows; and have been documented in large conifer snags, inside basal hollows of redwoods and giant sequoias, and bole cavities in oaks. Cavities in broken branches of black oak are very important and there is a strong association with black oak for roosting. Roosting sites are usually selected near the entrance to the roost in twilight rather than total darkness. The site must protect bats from high temperatures, as this species is intolerant of roosts in excess of 104 degrees Fahrenheit. Pallid bats are also very sensitive to roost site disturbance (Harris 1990a). Night roosts are usually more open and may include open buildings, porches, mines, caves, and under bridges (Harris 1990a).

Suitable roost sites for pallid bats in the form of large trees and snags do occur in the project area. Other structures, including buildings and bridges, also occur within or adjacent to project area, but are much more limited. Surveys have not been conducted within the project area, but because suitable large tree roost sites are fairly common and it is reasonable to conclude that pallid bats are present within the project area. Surveys will not be conducted for this species.

Townsend's Big-eared Bat (*Corynorhinus townsendii*)

Townsend's big-eared bats occur throughout the western United States. In California, the species is generally associated with cave systems, but they also found under older bridges, basal tree hollows and in the crevices of old buildings and mining structure. This species has been found Pluto Caves and other caves in the area north of Mount Shasta. Foraging associations include edge habitats along streams and areas adjacent to and within a variety of wooded habitats. The Townsend's bat is a moth specialist, with over 90 percent of its diet composed of lepidopterans (Harris 1990b).

Townsend's big-eared bats are sensitive to disturbance at roost sites and may abandon a roost site following a single disturbance (Harris 1990b).

Surveys have not been conducted and no known locations occur within the project area. Caves or open mines are not known to occur within the Project Area; however, suitable roost sites for

Townsend's big-eared bats in the form of large diameter trees are scattered throughout the project area. Thus, it is assumed that Townsend's big-eared bats are present in the project area. Surveys will not be conducted for this species.

Fringed myotis (*Myotis thysanodes*)

The fringed myotis is found in western North America from south-central British Columbia to central Mexico and to the western Great Plains. In California, it is distributed statewide except the Central Valley and the Colorado and Mojave Deserts (Harris 1990c). This species occurs on the Forest.

The fringed myotis uses caves, crevices, mines, and buildings for roosting, hibernacula, and maternity colonies (Harris 1990c). They day and night roost under bark and in tree hollows, and in northern California they day roost in snags only (Harris 1990c). Medium to large diameter snags are important day and night roost sites.

In California, this species is found from 1,300 to 2,200 meters in elevation in pinyon-juniper, valley foothill hardwood and hardwood-conifers (Harris 1990c).

There is increased likelihood of occurrence of this species as the number of snags greater than 30 cm in diameter increases and the percent canopy cover decreases. Large snags and low canopy cover, typical of mature, forest habitat types, offer warm roost sites. Decay classes were two to four in ponderosa pine, Douglas-fir, and sugar pine.

Open water sources may include artificial sources, such as stock tanks and ponds, in addition to natural sources. Home range size varies with insect abundance, increasing as the number of available insects decrease. Travel distances from roosting to foraging areas are up to eight kilometers (Harris 1990c). The fringed myotis consumes primarily beetles, and is supplemented by moths and fly larvae captured in the air and on foliage (Harris 1990c).

Suitable roost sites for fringed myotis bats in the form of large trees and snags do occur in the project area. Other structures, including buildings and bridges, also occur within or adjacent to project area but are much more limited. Surveys have not been conducted within the project area, but because suitable large tree roost sites are fairly common and it is reasonable to conclude that fringed myotis bats are present within the project area.

Western Pond Turtle (*Emys marmorata*)

The western pond turtle is found throughout California excepting desert regions (Morey 2000a). Western pond turtles are a highly aquatic species that can be found in ponds, lakes, streams, rivers, marshes, and irrigation ditches that have a muddy or rocky bottom and abundant vegetation (Stebbins 2003). They feed on aquatic plants, insects, worms, fish, and carrion (ibid).

Western pond turtles use terrestrial habitat for nesting and sometimes for overwintering. Females lay their eggs in soil and have been recorded nesting up to 300' from water (Holland 1991). Reese and Welsh (1998) reported that individuals moved an average of 600' from water to their overwintering sites.

Potential habitat for western pond turtles is present along the Scott River. This potential habitat will not be affected by the Lover's Canyon Project; surveys will not be conducted for this species.

Siskiyou Mountain Salamander (*Plethodon stormi*)

Siskiyou Mountain salamanders are typically found on forested slopes where rocky soils and talus outcrops occur. Occupied habitat for the species ranges from small, isolated rock outcrops to entire hillsides (Clayton et al. 1999). In a review by Ollivier et al. (2001), the species is commonly associated with closed canopy forests on north-facing slopes but can also be associated with diverse habitat variables including more open canopy, different slope aspects, slope position, and varying climatic conditions (Clayton et al. 1999). The available data suggests overall that these species are mainly associated with talus and fissured rock outcrops and are generally associated with moist, cool surface microclimates. While they may occur in variable conditions, they are likely more common in mature and old-growth forest than in other forest classes. Overall, available moisture and rocky talus appear to be the two most important habitat conditions for this species. Siskiyou Mountain salamanders are lungless salamanders that require moisture in order to respire through their skin and avoid desiccation (Nussbaum et al. 1983). These traits limit the time the species can be active at the surface where they forage (Nussbaum et al. 1983, Clayton et al. 1999). Although these salamanders may occasionally be detected under scattered surface rocks or woody debris, most detections are within layered rock (talus) with interstitial spaces that provide underground refugia from unfavorable environmental conditions.

The range of the Siskiyou Mountain salamander is limited to portions of three counties in southwestern Oregon and northern California (Clayton et al. 1999). On the Forest, known locations occur on the Oak Knoll and Scott River Districts, and numerous areas in the vicinity of Scott Bar Mountain (approximately five miles from the Lover's Canyon Project area).

The Lover's Canyon Project occurs outside talus habitats. There are no known sites of either Siskiyou Mountain salamanders in the project area.

Foothill Yellow-legged Frog (*Rana boylei*)

Known distributions of the foothill yellow-legged frog range through most Pacific drainages west of the Sierra and Cascade Crest from the Santiam River, Oregon to the San Gabriel Drainage in southern California (Zeiner et al. 1988-1990). They are typically found at elevations below 1,800 feet (Corkran and Thoms 1996). Current distribution and abundance of this species has been reduced in the southern portion of its range but still occurs in large numbers in some coastal drainages. Listed as a California Species of Special Concern and a Forest Service sensitive species, the foothill yellow-legged frog is at risk due to various anthropogenic and environmental threats throughout their range. Among some of the larger rivers in California, predation from introduced bullfrogs has been implicated as a cause of their decline. Increased sediment loads in breeding streams have a potential to reduce survival of eggs.

Breeding occurs in the spring, where adults congregate in habitats consisting of shallow, slow flowing water with pebble and cobble substrate, preferably with shaded riffles and pools. This species is also known to utilize moderately vegetated backwaters, isolated pools, and slow moving rivers with mud substrates in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood- conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types (Morey 2000b).

Surveys for the foothill yellow-legged frog have not been conducted in the project area and no known locations occur. The majority of in-stream environments within the project area have the potential for seasonal habitat for the foothill yellow-legged frog as they are characterized by steeper gradients or fast currents. The Scott River consists of slower lower gradient and slow moving

streams, and most likely contains year-round suitable habitat for foothill yellow-legged frogs, so it is reasonable to assume that this species is present in the project area. Surveys for this species will not be conducted.

Cascades Frog (*Rana cascade*)

The Cascades frog is a medium sized frog; olive to olive-brown with sharply defined dark splotches on the back. It is a montane species found in the Olympic Peninsula, Washington, and in the Cascade Range of Oregon, Washington, and northern California (Stebbins 2003). It appears that populations are declining throughout the range. Reasons for this decline are not well understood, but locally populations have been impacted by predation from introduced trout in mountain lakes.

Habitat for this species includes open montane meadows, marshes, ponds, small bodies of water, ephemeral pools, potholes without vegetation, and along small creeks (Stebbins 2003). They are typically found at elevations above 2,500 feet (Corkran and Thoms, 1996) and are closely restricted to water (Stebbins 2003). Aquatic habitat suitable for Cascades frogs is found throughout the project area. Almost all streams are characterized by steep gradients or, in low-gradient reaches, and typically consist of dense canopy. Surveys have not been conducted for Cascades frog and there are no known locations in the project area.

Tehama Chaparral Snail (*Trilobopsis tehamana*)

Habitat for the Tehama chaparral snail includes shaded talus and rock piles (Burke et al 2000). When environmental conditions are favorable, individuals may range from their refugia and can be found under leaf litter and other debris in adjacent forested habitat.

Tehama chaparral snails occur in numerous locations on the Forest are known to occur along the Shasta River on the Scott River Ranger District. There are no known sites in the project area; however, there is habitat present in the project area but no suitable talus habitat occurs in the proposed treatment area.

Western Bumble Bee (*Bombus occidentalis*)

The western bumble bee currently occurs in all states adjacent to California. Historically, the species was broadly distributed across western North America along the Pacific Coast and westward from Alaska to the Colorado Rocky Mountains. Historically, the western bumble bee was one of the most broadly distributed bumble bee species in North America. Currently, the western bumble bee is experiencing severe declines in distribution and abundance due to a variety of factors including diseases and loss of genetic diversity. In the absence of fire, native conifers encroach upon meadows, which also decreases foraging and nesting habitat available for bumblebees. The project area has a few small meadows that could provide potential habitat for the western bumble bee.

Survey and Manage Species

Many Survey and Manage species are also Region 5, Forest Service sensitive species and are discussed above. The three Survey and Manage species in categories for which pre-disturbance surveys are practical (see the Survey and Manage Analysis for additional information) that are not also Forest Service sensitive species are the Scott Bar salamander, Chace/Klamath Sideband, and Oregon Red Tree Vole.

The Scott Bar salamander locations are not known in the project area but their habitat associations are the same as for Siskiyou Mountain salamander (Mead et al. 2005); therefore, Siskiyou Mountain salamander serves as a proxy for Scott Bar salamander. There are no known locations in the analysis area. This species is associated with talus habitats and will not be affected with the proposed treatments.

The Chace/Klamath Sideband snail is not known to occur in the analysis area. Rocks and large woody debris serve as refugia during the summer and late winter seasons. Forest-wide standards and guidelines for large woody material will retain habitat refugia for this species.

The Oregon Red Tree Vole has not been found in any strategic surveys in or adjacent to the project area. There are no known locations in the analysis area. The analysis area is considered to be outside of the known range for this species. This species will not be analyzed further in this document.

Management Indicator Species

The full list of Forest management indicator species (MIS) was evaluated for applicability to this project (MIS report, Parts I and II). Table 9 displays the subset of the Forest MIS species that have habitat within the Lover's Canyon project area and may be potentially affected by proposed activities. The Grassland-Shrub-Steppe, mature ponderosa Pine, and high elevation true fir habitat associations do not occur within or adjacent to the project area so will not be included in this analysis. Ponderosa pine is a common component of the mixed conifer vegetation type that dominates the project area but the mature ponderosa pine association is evaluated primarily as an eastside; pure pine vegetation type that does not occur in the project area.

Table 9: Management Indicator Species relevant to the Lover's Canyon Project

Habitat Association	Habitat Association Description	Reasons for Selection as MIS
Hardwood Species Association		
Acorn woodpecker	Oak woodlands with associated large conifers	Indicator for diversity of oak species and large conifers
Western gray squirrel	Mature hardwood and mixed hardwood-conifer	Indicator for mature hardwood and mixed conifer-hardwood
River/Stream Species Association		
Tailed frog	Perennial montane streams with dense vegetation	Indicator for water quality, in-stream woody debris, bottom substrate, flows and channel condition
American dipper	Cold, swift, perennial streams	Indicator for water quality, instream woody debris, bottom substrate and flows
Northern water shrew	Riparian w/dense grass-forb cover	Indicator of riparian vegetation including canopy, deciduous veg, and grass/forb.
Long-tailed vole	Mesic habitats, dense riparian vegetation	Indicator of riparian vegetation including canopy, deciduous veg, and grass/forb.
Snag-dependent Species Association		

Habitat Association	Habitat Association Description	Reasons for Selection as MIS
Vaux's swift	Late-successional forests with large hollow snags	Indicator of large snags as a habitat element
Hairy woodpecker	Riparian deciduous habitats with large trees for cavities	Indicator of snags as a habitat element and for other species which depend on woodpeckers for cavities or as prey.
Downy woodpecker	Riparian deciduous habitats with large trees for cavities	Indicator of snags as a habitat element and for other species which depend on woodpeckers for cavities or as prey.
Pileated woodpecker	Late-successional coniferous forests	Indicator of snags as a habitat element and for other species which depend on woodpeckers for cavities or as prey.

Migratory Birds

Within the National Forest System, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales. At the Forest scale, the land allocations in the Forest Plan are designed to maintain a variety of habitat types that will provide habitat for migratory birds that may use the project area at some point during the year. Land allocations and management direction are designed to maintain species, community and genetic diversity.

Diverse natural communities are highly dependent upon the disturbance factors (such as fire regimes) that develop the structure and function of ecosystems. Communities can undergo negative changes in species composition and richness without these disturbance regimes or from the changes that result from a history of active management (reviewed in Attiwill 1994). In the Pacific Northwest region, Spies et al. (2007) cite declines in early-seral forests and broadleaf (hardwood) components of conifer-dominated landscapes on federal lands resulting from years of fire suppression and from the focus on old-growth conservation. Under current management policies, which focus on maintaining older forest structure, similar trends have been modeled into the future on federal and non-federal lands (Spies et al. 2007).

Negative impacts to songbird populations have been observed to occur as a response to large-scale vegetation changes (Drapeau et al. 2000). Specific to hardwood-associated bird communities, Betts et al. (2010) found positive associations of many songbird species with the amount of broadleaf and young broadleaf forests at broad spatial scales.

Understanding the type and extent of disturbance and other ecological mechanisms in landscapes of interest are critical when considering management approaches. The North American Bird Conservation Initiative identified the restoration of fire regimes as one of the most important challenges for forest managers nationwide. That synopsis details some successes and challenges to restoration projects including successful prescribed fire treatments and silvicultural practices that promote hardwood (broadleaf) regeneration. The Lover's Canyon Project proposes treatments that will increase resilience, reduce fuels and move the area towards a fire regime more representative of natural conditions. The project also proposes treatments that favor hardwoods and hardwood regeneration. On December 12, 2008, a Memorandum of Understanding (MOU) was signed by the U.S. Department of Agriculture Forest Service and the U.S. Fish and Wildlife Service (USFWS) to promote the conservation of migratory birds. This MOU directs agencies to evaluate the effects of

proposed actions on migratory birds, focusing first on species of management concern along with their priority habitats and key risk factors. For the Forest, the migratory bird species of management concern include species designated by the Regional Forester as Sensitive Species and species listed under Standard and Guidelines 8-21 through 8-34 of the Forest Plan as Management Indicator Species for project level assessment. Specific effects of the project on species listed as Sensitive or MIS are fully addressed in the Terrestrial Wildlife Biological Evaluation and the MIS Report Parts I and II, all available on the project website. Although federally-listed threatened or endangered species would be species of management concern, no migratory birds on the Forest are currently federally-listed as threatened or endangered.

Environmental Consequences

Alternative 1

Direct and Indirect Effects

This alternative does not include treatments and will result in no changes; therefore, no direct effects to individual wildlife or wildlife habitats (TES Species, Survey and Manage Species, Management Indicator Species, and Migratory Birds) are anticipated. The indirect effects expected will be those effects related to the continued increase of density related mortality and disease. Disease levels will continue to increase and add to the density related mortality that is occurring. Increasing disease levels also reduce growth rates and reduced the number of trees that will reach a larger diameter. Habitat conditions would remain as described in the existing condition for an undetermined amount of time. Overall, effects to wildlife and wildlife habitats of no action will result in 1) reduced availability and distribution of stands that could develop into suitable habitat for late successional habitat related species (northern spotted owl, fisher, and goshawk), 2) increased fuels loadings and increased risk of stand replacing fire resulting in the potential loss of forested habitats in the project area. Predictions of fuel model changes are summarized in the Lover's Canyon Fuel Specialists Report, 3) reduced availability and development of hardwoods and hardwood related wildlife species in the understory as they are outcompeted by the continuing encroaching conifers, 4) increased development of small diameter white fir that will dominate the understory and encroach upon the small openings in the untreated stands. This will result in a decrease quality of forest habitat conditions (dense small diameter understory with few openings for stand diversity).

Cumulative Effects

Future foreseeable Federal actions include (1) Lake Mountain and Middle Tompkins Grazing Allotment Management Plan (new project); (2) On-going Grazing Allotment Management Plans (3) Westside Fire Recovery (continued implementation); (4) Scott Bar Mountain Underburn and Habitat Improvement Project (continued implementation); and (5) Wooley Water/Road Special Use Permit Renewal. The Lake Mountain and Middle Tompkins Grazing Allotment Management Plan, Scott Bar Underburn, and the Wooley Water/Road Special Use Permit Renewal projects will have no measurable influence on wildlife habitats in the Lover's Canyon analysis area. The Westside Fire Recovery Project overlaps with the project area in the North Fork Kelsey Creek, South Fork Kelsey Creek, and Deep Creek-Scott River watersheds. There are approximately 25 acres, 30 acres, and 345 acres of fuels, vegetation, and roadside treatments in the North Fork Kelsey, South Fork Kelsey, and Deep Creeks respectively. The Westside Fire Recovery Project

focuses on removing fire killed or injured trees which does not have an effect on removing or downgrading NSO habitat. Fire and recovery related actions were accounted for in the NSO habitat layer used for the Lover's Canyon NSO analysis and should not contribute further cumulative effects.

Effects Common to Alternatives 2 and 3

Based on an evaluation of the project changes in the post-damage assessment of the 2017 storm damage for the Lover's Canyon area, there is no measurable change in Threatened, Endangered, or Sensitive Species habitat affected. The changes proposed to avoid new active features reduce the amount of proposed treatment than what was analyzed in the project wildlife analysis. Buffer areas have been designated around all new active landslide features within the project area, there will be no timber harvest or equipment allowed within these buffer areas. These buffer areas are sufficient to reduce any project related impacts to these active features, there will be no additional change to any of the wildlife analysis indicators within these areas.

Northern Spotted Owl

Direct and Indirect Effects

Commercial Thinning

The proposed treatment for all stands emphasize reduction of present stocking levels to enhance development of the residual mid-mature and younger stems and increase the longevity of the mature stems. Included in this treatment is biomass reduction to improve current and future stand resiliency to wildfire. Thinning of both commercial and pre-commercial sized conifers at variable densities would occur.

In the thinned areas trees of varying size classes would be removed with the majority being the smallest trees in the stands. Hardwoods would be retained. Where they exist, Douglas-fir and the pines would be favored for retention in all stands. Individual large trees would be cultured by removing most of the surrounding trees that are competing for moisture and sunlight.

Approximately 15 percent of the area in these stands will remain minimally treated to untreated. Spots containing groups of larger trees and other late seral attributes would be the type of places selected for retention.

After treatment the average tree diameter would be 10 percent larger than left untreated. This is further demonstrated by natural stands taking 10 years less than if left untreated to reach the desired condition of medium to large conifer size class. This is assumed in a landscape is free from large scale disturbance. Commercial treatment prescriptions will generally reduce basal areas by less than 30 percent of the starting basal area (Lover's Canyon Silviculture Report).

Based on the modeling predictions for the next 30 years there would be nearly 333 percent more trees greater than 26 inches in diameter than if left untreated. In 30 years stands would just be reaching densities where inter-tree competition induced mortality would again be starting to occur. Retention of hardwoods in the existing stands would occur.

Harvest Methods - Commercial thinning units will be harvested using tractors and yarders which will produce narrow openings in the understory and in the canopy for skylines. Tractors will create skid trails about 20 feet in width in the understory that will remove the entire understory within the

skid trails dispersed over about 700 acres. Skyline corridors will create an opening in the canopy and remove the understory vegetation within these 30-foot corridors which will transverse the units across about 120 acres. Even though these harvest methods will possibly degrade NSO habitat in the short term, the affected habitat is within the natural variability of disturbance within the landscape. However, the added effect of these openings plus the habitat changes from harvest will at least degrade habitat.

Skips – For Alternative 2, 46 commercial units (526-008, 526-009, 526-010a, 526-015, 526-016, 526-019, 526-020, 526-024, 526-030, 526-031a, 526-31b, 526-041, 526-090a, 526-096, 526-111, 526-146, 526-197, 527-012, 527-029, 527-081, 527-082, 527-151, 526-054, 526-055, 526-013, 526-064, 526-073, 526-076, 526-080, 526-085, 526-086, 526-088, 526-089, 526-090b, 526-097, 526-098B, 526-103, 526-104, 526-106, 526-109, 526-110, 526-113, 526-125, 526-418, 526-098A, and 527-150) will retain 15 percent skip areas that contain more mature trees (relative to the area) and range from ¼ to one acre in size.

For Alternative 3, 22 commercial units (526-008, 526-009, 526-010a, 526-015, 526-016, 526-019, 526-020, 526-024, 526-030, 526-031a, 526-31b, 526-041, 526-090a, 526-096, 526-111, 526-146, 526-197, 527-012, 527-029, 527-081, 527-082, and 527-151) will retain 15 percent skip areas that contain more mature trees (relative to the area) and range from ¼ to one acre in size. The remaining 24 units (526-054, 526-055, 526-013, 526-064, 526-073, 526-076, 526-080, 526-085, 526-086, 526-088, 526-089, 526-090b, 526-097, 526-098B, 526-103, 526-104, 526-106, 526-109, 526-110, 526-113, 526-125, 526-418, 526-098A, and 527-150) will retain 25 percent skip areas ranging from ¼ to two acres in size.

Commercial Harvest Effects to NSO Habitat

The effects to NSO habitat are described below in categories labeled as degrade, downgrade, and remove. **Degrade** signifies when treatments have a negative influence on the quality of habitat due to the removal or reduction of NSO habitat elements but *not to the degree where existing habitat function is changed*. This is when treatments have a negative influence on the quality of habitat due to the removal or reduction of NSO habitat elements but *not to the degree where existing habitat function is changed*. **Downgrade** applies to treatments that reduce habitat elements *to the degree the habitat will not function in the capacity that exists pre-treatment*, but activities will not remove habitat entirely (i.e., downgrade from nesting/roosting to foraging habitat). means the habitat has been affected to the point where the habitat will not continue to function at its initial habitat type and it will drop down one level in habitat type. **Removal** applies to treatments that reduce habitat elements *to the degree the habitat will not function in the capacity that exists pre-treatment*, but activities will not remove habitat entirely (i.e., downgrade from nesting/roosting to foraging habitat). These categories aid in describing the level of effects of NSO habitat by estimating the changes in existing habitat condition and the resulting habitat condition after treatment. Several qualitative and quantitative attributes were considered in this process and described in the methods section of this document.

No nesting/roosting habitat will be degraded, downgraded, or removed with the proposed commercial treatments.

Degrade Foraging Habitat - Of the silviculture treatments, about 662.7 acres of foraging habitat will be degraded by the commercial treatments. These treatments will retain basal areas over 120 inches per acre) and overstory canopy cover that is greater than 40 percent. Using FVS estimates,

the number of large trees (greater than 26 inches in diameter at breast height) will remain high (about five trees per acre) immediately after treatment and provide habitat for prey species and perches for NSO. Canopy closure will result in post-harvest conditions of greater than or equal to 40 percent and moderate level of variable stand density. Hardwoods will be retained in most prescriptions. For Alternative 3 treated areas will retain either 15 percent or 25 percent skip areas as described in Table 18. Post-activity fuels treatments likely consume small pieces of wood, herbaceous vegetation, and possibly kill brush, but these units will not likely be burned completely and un-burned areas should retain understory structure. Immediately after the underburn, the number of prey is likely to decline until vegetation regenerates. All but one harvest treatment unit (526-080) with foraging habitat area expected to remain foraging based on plot data and silviculture prescriptions.

Downgrade Foraging Habitat – An estimate of 9.3 acres of foraging habitat will be downgraded to dispersal habitat in Unit 526-080. This unit is starting with a 170 inch per acre basal area and is expected to have canopy closure reduced to about 40 percent (range of 34 percent to 56 percent) with wider spacing between trees. The density of trees will be reduced, but the number of large trees will average about five per acre. The non-commercial treatment and underburn will remove similar amount of understory as the degraded foraging habitat and will have similar effects to prey species immediately after treatment, but this unit may produce more prey species habitat in the short-term with the more open tree canopy that may in response produce higher levels of understory vegetative cover.

Remove Foraging Habitat – No removal of foraging habitat will occur with the proposed commercial treatments.

Maintain Dispersal Habitat - After treatment, all commercial treatment units will provide some cover for dispersing NSO and should not impede the movement of NSO to move through the area. Given the amount of understory vegetation response, these units may improve prey populations for adjacent stands of suitable NSO habitat (Sakai and Noon 1997).

Remove Dispersal – No commercial treatment will result in the removal of dispersal habitat. There may be some degradation from existing condition but treatment will retain habitat for dispersal.

Table 10: Projected Pre- and Post- NSO Habitat Condition

Harvest Unit	Pre-harvest Habitat				Post-harvest Habitat			
	Disp	F	NR	Non	Disp	F	NR	Non
526-008	6.1	0	0	0	6.1	0	0	0
526-009	0	0	0	4.6	0	0	0	4.6
526-010a	0	8.4	0	0	0	8.4	0	0
526-015	0.4	4.9	0	0.5	0.4	4.9	0	0.5
526-016	0	0	0	1.4	0	0	0	1.4
526-019	0	0.1	0	7.4	0	0.1	0	7.4
526-020	0	0	0	8.9	0	0	0	8.9

Harvest Unit	Pre-harvest Habitat				Post-harvest Habitat			
	Disp	F	NR	Non	Disp	F	NR	Non
526-024	6.1	0	0	0	6.1	0	0	0
526-030	0	0	0	26.9	0	0	0	26.9
526-031a	0	2.6	0	20.2	0	2.6	0	20.2
526-031b	0	0	0	4.8	0	0	0	4.8
526-041	12.7	8	0	2.3	12.7	8	0	2.3
526-090A	0	0.1	0	9.4	0	0.1	0	9.4
526-096	7	20	0	0.3	7	20	0	0.3
526-111	0	8	0	0	0	8	0	0
526-146	0	17.1	0	0	0	17.1	0	0
526-197	0	9	0	0	0	9	0	0
527-012	0	7.3	0	14.7	0	7.3	0	14.7
527-029	0	0	0	8.5	0	0	0	8.5
527-081	0	11	0	3.2	0	11	0	3.2
527-082	0	3.6	0	0	0	3.6	0	0
527-151	0	6	0	0	0	6	0	0
524-053*	0	3.6	0	0	0	3.6	0	0
524-054*	0	33.5	0	0	0	33.5	0	0
524-055*	0	51.2	0	0.3	0	51.2	0	0.3
526-013*	0	20.9	0	2.2	0	20.9	0	2.2
526-064*	0	41.7	0	8.6	0	41.7	0	8.6
526-073*	12.1	14.8	0	1.1	12.1	14.8	0	1.1
526-076*	9.5	0	0	0.6	9.5	0	0	1.9
526-080*	0	9.3	0	0.3	9.3	0	0	0.3
526-085*	1.2	17.8	0	0	1.2	17.8	0	0
526-086*	0	38.2	0	0	0	38.2	0	0
526-088*	0	24	0	1.7	0	24	0	0
526-089*	0	22.4	0	2.3	0	22.4	0	2.3
526-090B*	0	36.5	0	0.9	0	36.5	0	0.9
526-097*	0	8.5	0	0	0	8.5	0	0
526-098B*	5.1	66.2	0	1.1	5.1	66.2	0	1.1
526-103*	0	4.1	0	8.5	0	4.1	0	8.5
526-104*	0	14.6	0	5.7	0	14.6	0	5.7
526-106*	0	1.8	0	0	0	1.8	0	0

Harvest Unit	Pre-harvest Habitat				Post-harvest Habitat			
	Disp	F	NR	Non	Disp	F	NR	Non
526-109*	0	47.7	0	3.8	0	47.7	0	3.8
526-110*	0	22.5	0	0	0	22.5	0	0
526-113*	0	5.1	0	0.2	0	5.1	0	0.2
526-125*	0	7.2	0	0.1	0	7.2	0	0.1
526-418*	0	17.9	0	0	0	17.9	0	0
526-098A*	0	28.1	0	0	0	28.1	0	0
527-150*	0	28.3	0	0.6	0	28.3	0	0.6
Grand Total	60.5	672	0	151.7	69.8	662.7	0	151.7

*In Alternative 2 all commercial units will have 15 percent skips ranging in size from ½ to one acre. In Alternative 3 these commercial units will have 25 percent skip areas ranging from ¼ to two acres in size and remaining units will have 15 percent skips ranging in size from ¼ to one acre.

Pre-commercial Thinning

Pre-commercial thinning will occur on 1,190 acres. This thinning is expected to degrade 44.1 acres of foraging habitat. The pre-commercial thinning prescription in foraging habitat will retain foraging character after treatment. Pre-commercial thinning is expected to have long-term enhancement of forage character, improve forest health conditions, and reduced fuels. Many stands currently have a young component of overstocked trees that are growing and developing slowly due to inter-tree competition. Thinning these areas will increase growth to provide for larger trees in a shorter period of time.

Approximately 70.6 acres occur within dispersal habitat and the remaining 1,075 acres occur in non-habitat. Dispersal habitat will not be directly affected by the proposed pre-commercial thinning. The treatment will reduce the understory vegetation, but the canopy closure and existing larger trees will be retained. The fuels treatment associated with pre-commercial thinning will further reduce the understory structure by removing small woody debris, but the level of effect is dependent on the fire prescription.

Fuels Treatment

Fuels treatment will reduce much of the smaller (less than 12 inches diameter at breast height) understory vegetation. The smaller vegetation provides understory structure commonly used by some NSO prey species for survival and reproduction and the removal of this vegetation will likely reduce the number of prey for at least the mostly ground dwelling species (e.g. woodrats and mice). The reduction of prey in these treatment units will not likely drop to the point that prey are not available to NSO and these effects are likely to persist for a short period of time as the vegetation regenerates.

Wildland Urban Interface Treatments

The proposed treatment of 158 acres of WUI treatments will remove dead and live vegetation under 12 inches in diameter and will be disposed of by chipping, piling with follow-up burning. This treatment will reduce flame length, intensity, and the potential for crown fire activity.

Eighteen acres of nesting and roosting habitat will be treated in the home range of KL0247 (WUI Unit 526-199). One hundred twenty-five acres of foraging habitat will be treated in the home ranges of KL0247 and KL0094 shift) (WUI Units 526-199, 524-102, and 524-101). Based on the proposed treatment nesting and roosting, and foraging will be degraded but maintained after treatment.

Lover's Camp Fuels Treatment Unit

The proposed treatment of 36 acres of hand treatments will remove dead and live vegetation under 12 inches in diameter and will be disposed of by chipping, piling with follow-up burning. No nesting and roosting, or foraging habitat will be treated. Thirty-six acres of dispersal habitat will occur in the core of KL0248 shift (Unit 526-144). Based on the proposed treatment dispersal habitat will be degraded but maintained after treatment.

Roadside Fuel Treatments

The proposed treatment of 24 acres will remove dead and live vegetation under 12 inches in diameter and will be disposed of by chipping, piling with follow-up burning. Twenty-two acres of foraging and two acres of nesting and roosting habitat will occur in the home ranges of KL0094 shift and KL0298 (Unit 526-198B). Based on the proposed treatment foraging and dispersal habitat will be degraded but maintained after treatment.

Strategic Ridgeline Fuelbreak

The proposed treatment of 37 acres will remove dead and live vegetation under 12 inches in diameter and will be disposed of by chipping, piling with follow-up burning. No nesting and roosting habitat will be treated. Thirteen acres of foraging and two acres of dispersal habitat will occur in the home ranges of KL0094, KL0247, and KL0298 (Unit 526-193). Based on the proposed treatment foraging and dispersal habitat will be degraded but maintained after treatment.

Prescribed Underburn Treatments

The proposed underburns will occur on 2,223 acres in underburn three units (524-100, 526-195, and 526-196). Underburn unit 524-100 will occur with the core and home range of KL0094 shift. Unit 526-195 will occur with the home range of KL0247 and KL0298. Unit 526-196 will occur in core and home range of KL0298 and the home ranges of KL0096, KL0247, and KL0353. Underburns can affect important prey habitat. Prey abundance is an important part of NSO foraging habitat thus a reduction of prey can affect the quality of forage habitat. The underburn will likely remove portions of the understory and may possibly affect the overstory by causing tree mortality. Given the narrow burn conditions for an underburn, the overstory will likely not be reduced by more than five percent. Underburn prescriptions will have the objective of affecting no more than a five percent loss of total crown closure in suitable northern spotted owl habitat overall. Effects of mosaic burns may result in small openings created from crown burned individual trees or small groups of trees less than 12 inches. Crown closure of stands will not go below 60 percent in northern spotted owl nesting/roosting habitat or 40 percent in northern spotted owl foraging habitat (this includes hardwood, subdominant, and dominant tree component over 15 feet). Underburning will occur in 302 acres of nesting and roosting habitat, 1,357 acres of foraging habitat, and 60 acres of dispersal habitat. Based on the proposed underburn prescription objectives, nesting and roosting, foraging and dispersal habitat will be degraded but maintained after treatment.

Roads and Landings

No new road construction is proposed. Existing roads, existing roadbeds, and temporary roads will be used for project implementation. Existing roadbeds will also be used for temporary access where available, and then will be closed and hydrologically stabilized following unit treatments. No new temporary access roads will be created outside of harvest units. An estimated 10 segments of temporary road will be used totaling 1.15 miles, of that about 1.05 miles are on existing roadbeds. Temporary roads will not affect existing habitat outside of harvest units.

Existing landings will be used to the extent possible. The majority of skyline will be yarded to “continuous” landings, which are widened areas of existing road bed sufficient to facilitate operation of cable yarders and swing loaders. This project will utilize about 63 landings for ground-based operations, ranging in size from one quarter to one acre in size. There will be about 19 new landings constructed. New landings will not be constructed in Riparian Reserves. The remaining 44 landings will be on existing sites. These landings do not occur in contiguous acres. Instead they will be distributed throughout the project. Location of new landings is not specified at the time of this document. There will be an estimate of 19 acres of forage habitat removal with the proposed construction if new landings. Specific new landing locations is not known but will be coordinated with the District wildlife biologist before construction.

Effects on Northern Spotted Owl Home Ranges

Thresholds of habitat take for NSO core areas and home ranges area were described by FWS (2009) using a synthesis of the current NSO research. FWS suggested 400 acres of suitable habitat split into 250 acres of NR and 150 acres of F habitat within the core (0.5 mile radius). The habitat analysis for the activity center core areas shows that seven of the ten home ranges are below habitat threshold (KL0096, KL0247, KL0248 Shift, KL0298, KL4095, KL4097 and KL0096B). The remaining three activity center core areas exceed habitat threshold (KL0094 Shift, KL0353, and KL4085). All activity center core areas are deficit of NR habitat except KL4085.

At the home range scale (1.3 mile radius), FWS suggested 1,335 acres of suitable habitat split between 250 acres of nesting and roosting and 1,085 acres of foraging habitat. All home ranges are above the 1,335 acre threshold of suitable habitat, but KL4097 contains less than 250 acres of nesting and roosting habitat.

Based on the predicted changes in habitat all activity center cores and home ranges will remain suitable after treatment. No downgrading or removal of habitat is expected in any activity center except KL0247 where there will be a downgrading of 9.3 acres of foraging habitat in the core (Table 11).

Table 11: Changes in NSO habitat within cores and home ranges in commercial harvest treatments

Activity Center	PRE/POST Acres - 0.5 mi Radius			PRE/POST acres - 1.3 mi Radius		
	NR	F	Total NRF	NR	F	Total NRF
KL0094 Shift	80/80	381/381	461/461	540/540	2,182/2,182	2,722/2,722

Activity Center	PRE/POST Acres - 0.5 mi Radius			PRE/POST acres - 1.3 mi Radius		
	NR	F	Total NRF	NR	F	Total NRF
KL0096	4/4	319/319	323/323	621/621	1,508/1,508	2,129/2,129
KL0247	209/209	128/119	337/328	269/269	1,224/1,215	1,493/1,484
KL0248 Shift	164/164	166/166	330/330	960/960	1,841/1,841	2,801/2,801
KL0298	0/0	395/395	395/395	458/458	2,111/2,111	2,569/2,569
KL0353	50/50	452/452	502/502	1,020/1,020	2,016/2,016	3,036/3,036
KL4085	306/306	139/139	445/445	1,234/1,234	1,098/1,098	2,332/2,332
KL4095	59/59	269/269	328/328	300/300	1,746/1,746	2,046/2,046
KL4097	42/42	273/273	315/315	186/186	1,372/1,372	1,558/1,558
KL0096B	268/268	102/102	370/370	853/853	1,370/1,370	2,223/2,223

Specific Effects for Each Activity Center

KL0094Shift. Activity center KL0094Shift core currently contains 80 acres of nesting and roosting habitat and 381 acres of foraging habitat. For this project, no acres of habitat will be removed or downgraded in the core; however, about 51 acres of foraging habitat will be degraded by commercial harvest. In the home range, about 163 acres of foraging habitat will be degraded by commercial treatment. Degradation of foraging habitat will also occur in 15 acres of pre-commercial thinning, 70 acres of WUI treatment, and 20 acres of roadside fuels break. Lastly, underburning will degrade approximately 338 acres of foraging habitat and 154 acres of nesting roosting habitat but some of these acres are overlapped with other treatments. All habitat degradation is expected to remain suitable after treatments.

KL0096. Activity center KL0096 core currently contains only four acres of nesting and roosting habitat and 128 acres of foraging habitat. For this project, no acres of habitat will be removed or downgraded in the core; however, about 28 acres of foraging habitat will be degraded by commercial harvest. In the home range, about 92 acres of foraging habitat will be degraded by commercial treatment. Degradation of foraging habitat will also occur in approximately 19 acres of pre-commercial thinning and 13 acres of ridgetop fuel break. Lastly, underburning will degrade approximately 340 acres of foraging habitat but some of these acres are overlapped with other treatments. All habitat degradation is expected to remain suitable after treatments.

KL0247. Activity center KL0247 core currently contains 209 acres of nesting and roosting habitat and 319 acres of foraging habitat. Nine acres of foraging habitat will be downgraded in the core (Unit 526-080). Twenty-six acres of foraging habitat will be degraded by commercial harvest in the core. In the home range, about 284 acres of foraging habitat will be degraded by commercial treatment. Degradation of foraging habitat will also occur in approximately one acre of pre-commercial thinning, 69 acres of WUI fuel break, and 11 acres of ridgetop fuel break. Lastly, underburning will degrade approximately 40 acres of foraging habitat and 78 acres of nesting and

roosting habitat but some of these acres are overlapped with other treatments. All habitat degradation is expected to remain suitable after treatments.

KL0248 Shift. Activity center KL0248 Shift core currently contains 164 acres of nesting/roosting habitat and 166 acres of foraging habitat. No habitat will be removed or downgraded in the core. Approximately five acres of foraging habitat will be degraded by commercial harvest in the core. In the home range, about 131 acres of foraging habitat will be degraded by commercial treatment. Degradation of foraging habitat will also occur in approximately three acres of pre-commercial thinning. Lastly, underburning will degrade approximately 312 acres of foraging habitat and 116 acres of nesting roosting habitat but some of these acres are overlapped with other treatments. All habitat degradation is expected to remain suitable after treatments.

KL0298. Activity center KL0298 core currently contains no acres of nesting/ roosting habitat, and 395 acres of foraging habitat. No acres of habitat will be removed or downgraded in the core. Approximately 146 acres of foraging habitat will be degraded by commercial harvest in the core. In the home range, about 446 acres of foraging habitat will be degraded by commercial treatment. Degradation of foraging habitat will also occur in approximately 20 acres of pre-commercial thinning, six acres of WUI fuel break, 15 acres of roadside fuel break, and 13 acres of ridgetop fuel break. Lastly, underburning will degrade approximately 903 acres of foraging and 100 acres of nesting roosting but some of these acres are overlapped with other treatments. All habitat degradation is expected to remain suitable after treatments.

KL0353. Activity center KL0353 core currently contains 50 acres of nesting/roosting habitat, and 452 acres of foraging habitat. No habitat will be removed, downgraded or degraded in the core from commercial harvest, pre-commercial thinning, or fuels treatments. In the home range, 149 acres of foraging habitat will be degraded by commercial treatment. Degradation of foraging habitat will also occur in approximately four acres of pre-commercial thinning. Additionally, underburning will degrade approximately 352 acres of foraging habitat and 142 acres of nesting roosting habitat but some of these acres are overlapped with other treatments. All habitat degradation is expected to remain suitable after treatments.

KL4085. Activity center KL4085 core currently contains 306 acres of nesting/roosting habitat, and 139 acres of foraging habitat. No acres of habitat will be removed, downgraded, or degrade in the core. Approximately three acres of foraging habitat will be degraded by commercial harvest in the core. In the home range, no habitat will be removed or downgraded commercial treatments or fuels treatments. Underburning will degrade approximately 16 acres of foraging and nine acres of nesting roosting but some of these acres are overlapped with other treatments. All habitat degradation is expected to remain suitable after treatments.

KL4097. Activity center KL4097 core currently contains 42 acres of nesting/roosting habitat, and 273 acres of foraging habitat. No acres of habitat will be removed, downgraded, or degraded in the core from commercial treatments. Approximately one acre of foraging habitat will be degraded by pre-commercial thinning in the core. In the home range, no habitat will be removed or downgraded commercial treatments or fuels treatments. Seventeen acres of foraging habitat will be degraded by pre-commercial thinning. All habitat degradation is expected to remain suitable after treatments.

KL0096B. Activity center KL0096B core currently contains 268 acres of nesting/roosting habitat, and 102 acres of foraging habitat. No acres of habitat will be removed, downgraded, or degrade in the core. In the home range, no habitat will be removed or downgraded commercial treatments or

fuels treatments. Eight acres of foraging habitat will be degraded by pre-commercial thinning. Habitat degradation is expected to remain suitable after treatments.

Overall, the combined treatments resulting in forage habitat degradation will occur highest in four activity center cores (KL0247, KL0094Shift, KL0298, and KL0248Shift) and five home ranges (KL0247, KL0094Shift, KL0298, KL0248Shift, and KL0353). The combined acres treated in foraging habitat degraded in these five home ranges are summarized in Table 12. The highest estimate of combined treatments in current suitable habitat will occur in KL0298 home range at approximately 63 percent of available home range habitat. The combined degradation effect to NSO habitat in these home ranges is unknown however implementation of the proposed treatments could take 10 years or more to complete. Implementation over a 10 year period may decrease the severity of the combined effect. This combined treatments may result in short-term impacts to NSO and NSO habitat. There are however, anticipated long-term beneficial effects of treatments by reduced fuels and reduced potential of stand-replacing fire as well as an increase in tree diameters within 30 years. All of these long-term effects should increase forage habitat quality and resiliency.

Table 12: Estimated Percent of Combined Treatments in Suitable Habitat in 5 NSO Home Ranges

Home ranges with highest combined treatments in suitable habitat	Estimate of % available suitable habitat in 1.3 mile home range with degradation
KL 0247	35%
KL0094Shift	30%
KL0298	63%
KL0248Shift	20%
KL0353	21%

Treatments in Late-Successional Reserve

Five 100-acre Late-successional Reserves occur in the analysis area. No suitable nesting, roosting, or foraging habitat will be downgraded or removed. There are approximately 101 acres of proposed underburn within foraging habitat in the 100-acre LSRs that surround NSO activity centers KL0298 and KL0248. Underburning prescriptions may result in degradation but should maintain foraging habitat quality after treatment. In addition, there are approximately two acres of pre-commercial thinning treatment occurring in the 100-acre LSR surrounding KL4097. This thinning treatment will not occur in suitable habitat and may enhance the future growth of foraging habitat.

Barred Owl Effects on NSO

Many studies have found negative correlations between NSOs and barred owls where they co-occur but the effect of forest management on barred and spotted owl interactions is not well documented. Even without fully understanding the effects of forest management, recent research has expressed the importance of maintaining high quality nesting/roosting habitat and decreasing habitat fragmentation to minimize NSO interactions with barred owls (Dugger et al. 2005, Dugger et al. 2011, and Wiens et al. 2014).

Nesting roosting habitat in the project area has been strongly influenced by past land management. Plantations and older clearcuts are distributed throughout the analysis area. Scattered areas of nesting/roosting habitat exist in the mid-elevations in un-roaded and wilderness areas and in small patches along the Scott River corridor. The proposed project treatment areas are almost entirely in the center portion of the analysis area away from the higher valued nesting/roosting habitat. However, underburning and some roadside treatments will occur in nesting roosting habitat. There is no expected downgrade or removal of nesting/roosting habitat.

NSO foraging habitat is well-distributed throughout the analysis area. Non-commercial treatment units and underburn unit will not downgrade or remove foraging habitat thus it is unlikely that these actions will have a significant effect on influencing the likelihood or outcome of barred owl and northern spotted owl interactions. Recent survey effort in the analysis area has indicated no barred owl presence. However, if barred owls become present within the same area as NSO, barred owls may push NSO into other areas.

The long-term trend of barred owl and spotted owl interactions in the analysis area is not known. NSO surveys have occurred in the project area for many years with no barred owls detected. We can assume NSO and barred owls could interact if barred owls become present on the landscape but the effects of these interactions are not clear. Implementation of the proposed actions will mostly degrade foraging habitat (except for nine acres of downgrading of foraging habitat in commercial treatment unit 526-080). However, foraging habitat is not limited in the analysis area and the degraded foraging habitat will remain functional as foraging habitat. Even though the effects of forest management on NSO and barred owl interactions are not completely understood, the treatment will not affect the current level of nesting and roosting habitat and there is no evidence that interactions between NSO and barred owl will increase as a result of the proposed actions.

Noise Disturbance Effects

The Lover's Canyon Project includes sources of noise disturbance associated with use of heavy equipment and falling of trees during timber harvest, fuels treatments, landing construction/maintenance and hauling of logs and potential smoke disturbance associated with burning.

NSOs are highly mobile, and noise and smoke have a low probability of affecting NSOs that are foraging or dispersing across the landscape because of their ability to move away from disturbances. Noise and smoke have a higher likelihood of affecting adult and juvenile NSOs early in the breeding season when they are closely associated with the nest core; this is the period when juvenile owls are not yet able to fly and adults are closely defending the nest core. To minimize impacts to nesting NSO, a seasonal restriction will be used during early nesting period.

Effects on Northern Spotted Owl Critical Habitat

The Klamath West Critical Habitat Unit has experienced several habitat changes in recent years primarily related to fire. Frequent fire is a natural component of this unit which is obvious in landscape that surrounds the Lover's Canyon Project. The analysis area is mostly covered by critical habitat.

Although, the fires in 2014 did not largely change the amount and type of critical habitat in the Lover's Canyon Project analysis area, it did affect adjacent watersheds to the north and west. Each remaining acre of habitat in the critical habitat unit increases in NSO recovery value. Large portions of critical habitat have been lost to fire to the north and west of the project, just outside the analysis area. Given this large loss of habitat, NSO will have a reduced area to live and reproduce. The effects of downgrading or removing habitat in the Lover's Canyon project may not greatly affect the activity centers in the analysis area, but currently unoccupied NSO habitat may provide a refuge for displaced NSO from recent fires thus the value of the remaining habitat is likely important for NSO not currently within the analysis area.

Table 13 shows the proposed treatments in Critical Habitat. The proposed actions occurring within Critical Habitat will maintain Primary Constituent Elements throughout the analysis area for the northern spotted owl to sustain essential life history functions. There will be nesting roosting habitat (PCE 2) within roadside treatment areas (two acres) and 18 acres in WUI treatment. Nesting roosting will not be downgraded or removed after treatment. Commercial thinning will downgrade nine acres of foraging habitat (PCE 3) and degrade 665 acres of foraging habitat (PCE 3). Pre-commercial thinning treatments will degrade 60 acres of foraging habitat. Fuels treatments will degrade 143 acres of foraging habitat. Underburning will result in the degradation of approximately 302 acres of NR and 1,354 acres of foraging habitat. Combined treatments of commercial thinning, pre-commercial thinning, and fuels treatments will occur in dispersal habitat (PCE4). Underburning will occur in 504 acres of dispersal habitat that will remain dispersal habitat quality after treatment.

Approximately 55 percent of the available suitable nesting, roosting, and foraging habitat occurring within critical habitat will be degraded with the proposed treatments.

Table 13: Proposed Project Treatments within Northern Spotted Owl Critical Habitat by Treatment Type

Habitat	Acres of Habitat Within CHU Within Analysis Area	Commercial Thin (acres)	PCT (acres)	WUI Fuels Treatment (acres)	Roadside Fuels Treatment (acres)	Ridgetop Fuels Treatment (acres)	Lover's Fuels Treatment (acres)	Underburn (w/overlap acres)
Nesting/ Roosting	1,878	0	0	18	2	0	0	302
Forage	5,763	665	60	121	22	13	0	1,354
PFF	82	0	0	0	0	0	0	0
Dispersal	736	53	76	11	0	2	36	60
Non-Habitat	2,686	151	1,007	154	0	22	0	504

Gray Wolf

The likelihood of wolves occurring in the analysis area is low. Wolves are wide-ranging predators. They are known to generally avoid areas of high road densities and concentrated human use. Despite many reported observations of wolves in recent years made to the California Department of Fish and Wildlife, there has been no confirmed presence of the species, no den sites and no

rendezvous sites recorded anywhere in or near the project area. If a wolf was present in the project area, the wolf would likely not be near any project activity that may create measurable effects to the species. Therefore, we conclude the project action alternatives will result in a “no effect” determination. If at some point during the implementation of this project wolf activity is detected in the project area, Project Design Features specific to wolves will apply to the proposed action. The presence of wolves on the landscape may require coordination and potentially new Section 7 consultation with the USFWS.

North American Wolverine

Sightings of this species are rare in Northern California; sightings range from Del Norte and Trinity Counties east through Siskiyou and Shasta Counties, and south through Tulare County. Habitat distribution in California is poorly known for the North Coast and northern Sierra Nevada. In northern California, wolverines range from 500-1500 m elevation (1,600 to 4,800 feet) in Douglas-fir and mixed conifer and true fir habitats (Johnson 1990). Camera stations and track plate surveys have been conducted on the Forest but these surveys did not find wolverines. There are ten documented detections of wolverines on the Forest but no den sites are known. Surveys for wolverines have not been conducted within the Project Area. Due to habitat fragmentation and limited availability of older forest conditions, wolverines are not expected to be abundant in the project area. They may be present in the project area.

Based on the parameters of the harvest prescriptions and pre-commercial thinning prescriptions, the total affected acres of NSO foraging habitat will retain suitable character for wolverine habitat after treatment. One exception is nine acres of foraging habitat in Unit 526-080 which will reduce foraging habitat to a more open stand and not be suitable habitat for wolverine. Combining commercial, pre-commercial thinning, underburning and related fuel breaks, Alternative 2 and Alternative 3 will result in the degradation of approximately 2,537 acres of wolverine habitat. Habitat is expected to remain suitable for wolverine after treatment. Nine acres of wolverine, habitat will be reduced to non-habitat in Unit 526-080 in both alternatives.

Cumulative Effects

Future foreseeable actions include (1) Lake Mountain and Middle Tompkins Grazing Allotment Management Plan (new project); (2) On-going Grazing Allotment Management Plans (3) Westside Fire Recovery (continued implementation); (4) Scott Bar Mountain Underburn and Habitat Improvement Project (continued implementation); and (5) Wooley Water/Road Special Use Permit Renewal. The Lake Mountain and Middle Tompkins Grazing Allotment Management Plan, Scott Bar Underburn, and the Wooley Water/Road Special Use Permit Renewal projects will have no measurable influence on wildlife habitats in the Lover’s Canyon analysis area. The Westside Fire Recovery Project overlaps with the project area in the North Fork Kelsey Creek, South Fork Kelsey Creek, and Deep Creek-Scott River watersheds. There are approximately 25 acres, 30 acres, and 345 acres of fuels, vegetation, and roadside treatments in the North Fork Kelsey, South Fork Kelsey, and Deep Creeks respectively. The Westside Fire Recovery Project focuses on removing fire killed or injured trees which does not have an effect on removing or downgrading NSO habitat. Fire and recovery related actions were accounted for in the NSO habitat layer used for the Lover’s Canyon NSO analysis and should not contribute further cumulative effects.

Determination of Effects

The following conclusions led to my determination of the effects that the proposed Lover's Canyon Project will have on federally listed species:

North American Wolverine: Based on the above assessment of direct, indirect, and cumulative effects, it is my conclusion that implementation of the Lover's Canyon Project will result in a **"No Effect determination to the North American wolverine"**.

Gray Wolf: Based on the above assessment of direct, indirect, and cumulative effects, it is my conclusion that implementation of the Lover's Canyon Project will result in a **"No Effect determination to the gray wolf."**

Northern spotted owl: Based on the above assessment of direct, indirect, and cumulative effects, it is my conclusion that implementation of the Lover's Canyon Project will result in a **"May Affect, Likely to Adversely Affect (MALAA) determination to the NSO and NSO Critical Habitat."**

This determination is based on the following factors:

- No commercial treatment will occur in nesting/roosting habitat.
- Nine acres of foraging habitat will be downgraded to dispersal habitat. Approximately 2,223 acres of foraging habitat will be degraded but will retain foraging quality after treatment. Approximately 322 acres of nesting roosting habitat will be degraded with underburning but will retain nesting roosting quality after treatment.
- No commercial treatments will occur in Late Successional Reserves.
- Commercial treatments occurring within five home ranges that have recent activity will have skip areas representing 25 percent of each unit and range in size from ¼ to two acres. The remaining commercial treatments will have 15 percent skips ranging in size from ¼ to one acre.
- Application of Project Design Features are expected to minimize effects to NSO habitat and the likelihood that NSOs will be harassed, killed or injured during project implementation.
- Approximately 55 percent of the available suitable nesting, roosting, and foraging habitat occurring within critical habitat will be degraded with the proposed treatments.
- There will be an estimate of 19 acres of forage habitat removal with the proposed construction of new landings.
- Five occupied home ranges will have combined treatments occurring in 21 to 63 percent of the suitable habitat within these home range.

Effects Common to Alternatives 2 and 3 on Forest Service Sensitive, Survey and Manage, Management Indicator Species, and Migratory Birds

Direct and Indirect Effects

Due to the proposed action of Alternatives 2 and 3 either not occurring in known species range or not affecting any habitat, there are no expected direct, indirect, or cumulative effects on the following species (Table 14). With the implementation of snag-related Project Design Features and

the limited activities proposed older forested habitat in the watershed, Alternatives 2 and 3 will not limit the availability of large snag distribution for the pallid bat, fringed myotis, Townsend's big-eared bat, or the snag-associated MIS species in the analysis area.

With the implementation of riparian reserve related Project Design Features and the limited activities proposed riparian habitat in the watershed, Alternatives 2 and 3 will not limit the availability of riparian habitat conditions for the willow flycatcher, western pond turtle, or the riparian associated MIS species in the analysis area.

With the implementation of hardwood related Project Design Features and the implementing treatment prescriptions that will enhance hardwoods in the watershed, Alternatives 2 and 3 will not limit the availability of hardwoods for migratory songbirds and hardwood associated MIS species in the analysis area (Lover's Canyon Project MIS Reports Parts 1 and 2)

Table 14: Summary of species status, effects, and determination common to Alternatives 2 and 3.

Species	Status	Effects to Habitat	Determination
Bald Eagle	Sensitive	No habitat affected	No effect
Willow Flycatcher	Sensitive	No habitat affected	No effect
Great Gray Owl	Sensitive	No habitat affected	No effect
Pallid Bat	Sensitive	Snag distribution will be maintained throughout the watershed.	No effect
Northern Goshawk	Sensitive	Degradation of habitat	May affect, but not likely to lead to a trend towards Federal Listing
Wolverine	Sensitive, proposed for federal listing	Habitat but will remain suitable after treatment	May affect, but not likely to lead to a trend towards Federal Listing
Fisher	Sensitive	Degradation of approximately 4% of habitat in analysis area	May affect, but not likely to lead to a trend towards Federal Listing
American Marten	Sensitive	Degradation of 13 acre of suitable habitat	May affect, but not likely to lead to a trend towards Federal Listing
Townsend big-eared Bat	Sensitive	Snag distribution will be maintained throughout the watershed.	No effect

Species	Status	Effects to Habitat	Determination
Fringed Myotis	Sensitive	Snag distribution will be maintained throughout the watershed.	No effect
Western pond turtle	Sensitive	No habitat affected	No effect
Foothill Yellow-legged frog	Sensitive	No habitat affected	No effect
Cascades Frog	Sensitive	No habitat affected	No effect
Siskiyou Mountain Salamander	Sensitive and Survey and Manage	No habitat affected. No known sites.	No effect
Scott Bar Salamander	Survey and Manage	No habitat affected. No known sites.	No effect
Blue Gray Taildropper	Survey and Manage	No habitat affected. No known sites.	No effect
Tehama Chaparral Snail	Sensitive, and Survey and Manage	No habitat affected. No known sites.	No effect
Western Bumble Bee	Sensitive	No habitat affected	No effect
Acorn woodpecker	MIS	No habitat affected	No effect
Western gray squirrel	MIS	No habitat affected	No effect
Tailed frog	MIS	No habitat affected	No effect
American dipper	MIS	No habitat affected	No effect
Northern water shrew	MIS	No habitat affected	No effect
Long-tailed vole	MIS	No habitat affected	No effect
Vaux's swift	MIS	No habitat affected	No effect
Hairy woodpecker	MIS	No habitat affected	No effect
Downy woodpecker	MIS	No habitat affected	No effect
Pileated woodpecker	MIS	No habitat affected	No effect

American Marten

Alternatives 2 and 3 will degrade approximately 13 acres of potential marten habitat but will retain habitat quality after treatment. Because this loss only represents an estimate of less than one percent of the available habitat for this species, the effects of implementing Alternatives 2 and 3 will be minimal. There may be some loss of habitat structure after treatment however marten should remain viable in treated areas and well distributed in the analysis area. The proposed pre-commercial thinning, fuels treatments, underburning, and roadside treatments are not expected to have any effect on this species since these actions are either not going to occur in suitable habitat or will not measurably alter habitat conditions.

Northern Goshawk, Fisher, and Wolverine

Suitable northern spotted owl (NSO) nesting, roosting and foraging habitat is used as a proxy to evaluate potential northern goshawk, fisher, and wolverine habitat. The proposed commercial thinning activity in Alternative 2 and Alternative 3 will occur on approximately 672 acres of NSO foraging habitat. Pre-commercial thinning in Alternative 2 and Alternative 3 will occur on 44 acres of NSO foraging habitat. Based on the parameters of the harvest prescriptions and pre-commercial thinning prescriptions, the total affected acres of NSO foraging habitat will retain suitable character for northern goshawk, fisher, and wolverine habitat after treatment. One exception is nine acres of foraging habitat in Unit 526-080 which will reduce foraging habitat to a more open stand and not be suitable habitat for northern goshawk, fisher, and wolverine.

The fuels related work associated with WUI, ridgetop and roadside fuel breaks will degrade but not downgrade 162 acres of foraging habitat. Based on the parameters of the fuels treatment prescriptions, the total affected 162 acres of habitat will retain suitable character for northern goshawk, fisher, and wolverine habitat after treatment.

The proposed underburn will occur on approximately 302 acres of NSO nesting roosting habitat and 1,357 acres of NSO foraging habitat. Based on the parameters of the underburn treatment prescriptions, the total affected 1,659 acres of habitat will retain suitable character for fisher, wolverine, and goshawk habitat after treatment.

The proposed actions in NSO dispersal and non-habitat are not expected to have any effect on northern goshawk since these actions are not going to occur in suitable fisher, wolverine, and goshawk habitat.

Combining commercial, pre-commercial thinning, underburning and related fuel breaks, Alternative 2 and Alternative 3 will result in the degradation of approximately 2,537 acres of goshawk, fisher, and wolverine habitat. Habitat is expected to remain suitable for goshawk, fisher, and wolverine after treatment. Nine acres of goshawk, fisher, and wolverine, habitat will be reduced to non-habitat in Unit 526-080.

Cumulative Effects

Future foreseeable Federal actions include (1) Lake Mountain and Middle Tompkins Grazing Allotment Management Plan (new project); (2) On-going Grazing Allotment Management Plans (3) Westside Fire Recovery (continued implementation); (4) Scott Bar Mountain Underburn and Habitat Improvement Project (continued implementation); and (5) Wooley Water/Road Special Use Permit Renewal. The Lake Mountain and Middle Tompkins Grazing Allotment Management Plan, Scott Bar Underburn, and the Wooley Water/Road Special Use Permit Renewal projects will have no measurable influence on wildlife habitats in the Lover's Canyon analysis area. The Westside Fire Recovery Project overlaps with the project area in the North Fork Kelsey Creek, South Fork Kelsey Creek, and Deep Creek-Scott River watersheds. There are approximately 25 acres, 30 acres, and 345 acres of fuels, vegetation, and roadside treatments in the North Fork Kelsey, South Fork Kelsey, and Deep Creeks respectively. The Westside Fire Recovery Project focuses on removing fire killed or injured trees which does not have an effect on removing or downgrading NSO habitat. Fire and recovery related actions were accounted for in the NSO habitat layer used for the Lover's Canyon NSO analysis and should not contribute further cumulative effects.

Alternative 3 Summary

This Alternative was developed to address the concern regarding effects to areas identified as high value habitat for the northern spotted owl by incorporating more skips into the prescriptions within the commercial units identified as high value. The focus of this alternative is protecting higher value (more recently occupied) NSO habitat while aiming to achieve long-term beneficial effects in areas that are not currently occupied to improve future site quality. This alternative alters the silviculture prescriptions from Alternative 2 to allow for more structural diversity and important habitat components to remain on the landscape in the short-term. Increased structural diversity will help to retain microclimates and prey habitat features in treated areas. 25 percent skips also reduces the intensity of treatment in locations identified as high value for the northern spotted owl. The increase in the skip areas will increase the forage quality of the post-treatment commercial treatment areas. Treatments in Alternative 3 are identical to Alternative 2 with the exception of the differences described below.

- For commercial treatment units that were identified as high value, the silvicultural prescription was altered as follows (about 622 acres of commercial treatment):
 - Increase the percent of skip areas to 25 percent (Alternative 2 incorporated 15 percent skip areas into the prescription).
 - Increase the potential size of skips to two acres in size (Alternative 2 had a maximum area of one acre for skips).

Increasing the percent and size of skip areas into the silvicultural prescriptions is expected to leave a higher level of structural diversity immediately post-treatment reducing the short-term effects to northern spotted owl habitat that is identified as high value. This alternative was developed in accordance of Recovery Action 10 of the Revised Recovery Plan for the Northern Spotted Owl (2011b) which recommends the conservation of spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population. This alternative reduces the intensity of treatment in locations identified as high value for the northern spotted owl from what was proposed in Alternative 2 and meets Recovery Action 10 in the Revised Recovery Plan.

Comparison of Action Alternatives

Tables 15 and 16 show summary comparisons between alternatives for TES species, MIS, and Survey and Manage Species.

Table 15: Comparison of NSO Effects by Action Alternatives

Alternative	Effects on Nesting/Roosting in Analysis Area	Effects on Foraging in Analysis Area	Effects on Dispersal Habitat	Reduction of Foraging in core and home ranges	Effects on Critical Habitat
Alternative 2	0% reduction of NR. 7% degrade of NR from unburning	>1% downgrade of forage to dispersal 20% degrade of forage but will retain foraging habitat character	0 % acres of dispersal habitat downgraded or removed.	KL0094shift – 51 acres F degraded in core. 606 acres forage degraded, 15 acres NR degraded in HR. KL0096 – 28 acres F degraded in core. 464 acres F degraded in HR. KL0247 – 9 acres F downgraded, 26 acre NR degraded in core. 405 acres F degraded, and 78 acres NR degraded in HR. KL0248shift- 5 acres F degraded in core. 446 acres F degraded and 116 NR degraded in HR. KL0298 – 146 acres F degraded in core. 1403 acres F degraded and 100 acres NR degraded in HR. KL0353- 0 acres NRF affected in core. 505 acres F degraded and 142 acres NR degraded in HR. KL4085- 3 acres F degraded in core. 16 acres F degraded and 9 acres NR degraded in core. KL4097- 1 acre F degraded in core. 17 acres F degraded in HR. KL0096B- 0 acres affected in core, a acres F degraded in in HR.	Approximately 55% of available NRF in the Critical Habitat of the analysis area will be degraded but will maintain PCEs
Alternative 3	Same as Alternative 2	Same as Alternative 2 Benefits to forest stand structure with the increased 25% skip areas	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2

Table 16: Comparison of effects of alternative on Federally-listed, Sensitive, Management Indicator and Survey and Manage Species

Species	Alternative 1	Alternative 2	Alternative 3
Northern Spotted Owl	No effect	MALAA	MALAA

Species	Alternative 1	Alternative 2	Alternative 3
NSO Critical Habitat	No effect	MALAA	MALAA
Gray Wolf	No effect	No effect	No effect
Northern Goshawk, Fisher, and North American Wolverine.	No effect	Combining commercial, pre-commercial thinning, underburning and related fuel breaks, Alternative 2 will result in the degradation of approximately 2,537 acres of goshawk, fisher, and wolverine habitat. Habitat is expected to remain suitable for fisher, wolverine, and goshawk after treatment. Nine acres of goshawk, fisher, and wolverine habitat will be reduced to non-habitat.	Same as Alternative 2 Benefits to forest stand structure with the increased 25% skip areas
American Marten	No effect	Alternative 2 will result in the degradation of approximately 13 acres of marten habitat.	Same as Alternative 2
Bald Eagle	No effect	No habitat affected.	Same as Alternative 2
Willow Flycatcher	No effect	With the implementation of riparian reserve related Project Design Standards and the limited activities proposed riparian habitat in the watershed, Alternative 2 will not limit the availability of riparian habitat conditions.	Same as Alternative 2
Pallid Bat	No effect	Alternative 2 will not limit the availability of large snag distribution. Forest-wide standards and guidelines for snags will be met or exceeded.	Same as Alternative 2
Townsend Big-eared Bat	No effect	Alternative 2 will not limit the availability of large snag distribution. Forest-wide standards and guidelines for snags will be met or exceeded.	Same as Alternative 2
Fringed Myotis	No effect	Alternative 2 will not limit the availability of large snag distribution. Forest-wide standards and guidelines for snags will be met or exceeded.	Same as Alternative 2
Western Pond Turtle	No effect	With the implementation of riparian reserve related Project Design Standards and the limited activities proposed riparian habitat in the watershed, Alternative 2 will not limit the availability of riparian habitat conditions.	Same as Alternative 2
Yellow-legged Frog, Cascades Frog	No effect	With the implementation of riparian reserve related Project Design Standards and the limited activities proposed riparian habitat in the watershed, Alternative 2 will not limit the availability of riparian habitat conditions.	Same as Alternative 2

Species	Alternative 1	Alternative 2	Alternative 3
Siskiyou Mountain Salamander	No effect	No habitat affected. No known sites.	Same as Alternative 2
Tehama Chaparral Snail	No effect	No habitat affected. No known sites.	Same as Alternative 2
Western Bumble Bee	No effect	No habitat affected. No known sites.	Same as Alternative 2
Blue-gray tailed dropper	No effect	No habitat affected. No known sites.	Same as Alternative 2
Scott Bar Salamander	No effect	No habitat affected. No known sites	Same as Alternative 2
Hardwood MIS	No effect	Alternative 2 will not limit the availability of hardwood distribution. Silvicultural prescriptions will protect and promote hardwood habitat.	Same as Alternative 2
River/Stream MIS	No effect	With the implementation of riparian reserve related Project Design Standards and the limited activities proposed riparian habitat in the watershed, Alternative 2 will not limit the availability of riparian habitat conditions.	Same as Alternative 2
Snag-dependent MIS	No effect	Alternative 2 will not limit the availability of large snag distribution. Forest-wide standards and guidelines for snags will be met or exceeded.	Same as Alternative 2

Alternative 3 alters the silviculture prescriptions from Alternative 2 by increasing skip sizes from 15 to 25 percent on 24 units. This increase will help to allow for more structural diversity and important forest habitat components to remain on the landscape in the short-term. It also reduces the intensity of treatment in locations identified as high value for the northern spotted owl. This may have short term benefits to NSO, northern goshawk, fisher, and wolverine habitat.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Under Alternative 1, specific guidance, laws, regulations, or plans would not be violated, but by not addressing the stand conditions as described, this alternative would avoid meeting the intent of ecosystem management and other relevant guidance federal land management agencies are responsible for in the range of the Northwest Forest Plan. The 2011 NSO Recovery Plan outlines specific recovery actions which would address recovery through the maintenance and restoration of suitable habitat. The 2012 designation of NSO Critical Habitat identifies the importance of reducing the risk of large scale habitat loss and to restore ecosystem processes and functions in the fire prone landscapes like the California Klamath Province. Specifically, the CHU designation describes fuels treatments that reduce ladder and ground fuels while still retaining the stand structure that supports nesting, roosting, foraging, and dispersal habitat as “these actions may

reduce the risk of future loss of habitat to wildfire.” Alternative 1 would not work toward proactive efforts to retain or enhance suitable habitat for NSO and other late- successional species on a site or landscape level in the Lover’s Canyon Project area or provide specific measures that contribute to recovery of the NSO.

Due to the similarity between all action alternatives, this section will address them all. All action alternatives would be compliant with the Forest Plan and Survey and Manage Guidelines aimed at minimizing short term impacts to individuals and providing for long-term wildlife population persistence. The design of this project is consistent with Recovery Actions described in the 2011 NSO Recovery Plan. The action alternatives propose measures which would reduce the risk of large scale habitat loss and would attempt to restore ecosystem processes such as low and moderate intensity fires in this fire prone landscape on the upper portions of the slopes. Action alternatives describe fuels treatments that would reduce ladder and ground fuels while enhancing or retaining the stand structures and features that support nesting, roosting, foraging, and dispersal habitat fire modeling supports the intent described in the 2012 NSO CHU designation that federal land management actions reduce the risk of future loss of habitat to wildfire. Project design features, NSO survey strategy and potential effects have been initially reviewed by the local Level One team in 2013; Section 7 consultation will be completed with the US Fish and Wildlife office.

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APPENDIX A – ADDITIONAL INFORMATION ON ACTION ALTERNATIVES

Alternative 2

The Forest proposes to use a combination of silvicultural prescriptions and fuels treatments to bring the project area to meet the purpose and need. The silvicultural prescriptions include commercial and non-commercial harvests for forest health and fuels reduction. Fuels treatments include wildland urban interface fuels treatments, strategic ridgeline fuel breaks, roadside fuel breaks, and prescribed burning.

The Forest Service proposes this alternative to meet the purpose and need. The proposed action will treat approximately 4,680 acres within the 11,810 acre project boundary. Acres by treatment type are described below and do not account for the overlap in treatment types. Riparian Reserves within and adjacent to treatments units were evaluated on a site-by-site basis for treatment, and will include equipment and treatment exclusion zones as described in the project design features.

Treatments would include commercial thinning on up to 884 acres; non-commercial thinning on up to 1,317 acres; fuels treatments on up to 255 acres; removal of hazard trees along National Forest System roads, county roads, campgrounds, and other high use recreation areas within the project boundary; and prescribed burning on up to 2,223 acres. The time frame for implementation of all aspects of this project is estimated to take about 10 years.

Silvicultural Prescriptions

Thinning prescriptions will be developed on a stand-by-stand basis to meet the objectives of the purpose and need. However, in general the prescription will be a variable density thinning from below, focusing on stands in the small conifer structural class. Of the stands selected for potential treatment, more than half are existing plantations (about 1,700 acres). The remaining area is made up of previously managed natural stands. The Forest is proposing to accomplish these treatments through hand and mechanical thinning with ground-based and skyline logging systems, while hand piling, lop and scattering, biomass harvesting, or mastication is proposed in existing plantations. Activity fuels within harvest units will be hand piled, landing piled, and made available for biomass or permitted public fuelwood collection prior to burning.

Commercial Treatment, Natural Stands (previously managed) (about 716 acres):

The stands would be thinned from below to an SDI of less than 220 followed by treatment of all existing and activity created fuels. Post-harvest fuels treatment will be with handpiling or underburn. Scattered, larger, dominant Douglas-fir, ponderosa pine and sugar pine will be cultured throughout the stands by removing surrounding trees that are competing for sunlight, moisture and soil nutrients. Canopy cover would range from forty to sixty percent. The greater canopy cover is desired where it currently exists and is comprised of the larger, thriftier trees in order to: maintain higher fuel moistures in surface fuels, reduce understory brush establishment and growth, and reduce fuels treatment maintenance costs, intervals and intensities. The pine species and Douglas-fir would be favored. Individual trees that have had stressors removed or reduced will be more resistant and resilient to climate changes (Joyce et al. 2009).

Commercial Treatment, Plantations (about 169 acres):

The stands would be thinned from below, at variable spacing. Trees in the smaller size classes would most frequently be removed. Scattered, larger, dominant ponderosa pine, incense cedar, sugar pine or Douglas-fir found singly or in groups will generally be retained and in some instances cultured by removing trees that are competing for sunlight, moisture and soil nutrients. The large tree culturing will: increase its resistance to insect attack; retain for a longer period of time more of the trees live crown; in some instances increase the growth rate of the tree. This culturing will create small gaps in the canopy of the stand. Hardwoods where they exist will be retained and their growth encouraged by thinning around them. Portions of the stands have a fair component of conifers less than ten inches in diameter. Where no larger, nearby conifers (greater than ten inches in diameter) exist, these thickets would be pre-commercially thinned. In areas where there are healthy, vigorous trees nearby, these smaller stems would be removed. In stands where offsite stock was planted retaining naturally regenerated conifers will be chosen for retention and wider spacing incorporated to retain those trees that have the potential to achieve the desired sizes for late successional old growth stands. Post-harvest fuels treatment will be with handpiling or underburn. Table A-1 shows habitat distribution in each of the harvest units. Twenty-two units (832.8 acres) will have 15% retention in skip areas. Retentions skips will range from ¼ to one acre in size. Twenty-four units (632.8 acres) will have 25% retention in skips areas ranging in size from ¼ to two acres in size.

Table A-1: NSO habitat by commercial harvest treatment unit

Harvest Unit	Method	Basal Area / QMD	Est Age	Dispersal	Forage	Nest/Roost	Non-Habitat	Grand Total
526-008	Ground	320/15	54	6.1	0	0	0	6.1
526-009	Ground	320/15	54	0	0	0	4.6	4.6
526-010a	Ground	270/13	55	0	8.4	0	0	8.4
526-015	Ground	280/12	55	0.4	4.9	0	0.5	5.8
526-016	Ground	280/12	55	0	0	0	1.4	1.4
526-019	Ground	240/13	55	0	0.1	0	7.4	7.5
526-020	Ground	240/14	55	0	0	0	8.9	8.9
526-024	Skyline	240/14	55	6.1	0	0	0	6.1
526-030	Ground	210/17	55	0	0	0	26.9	26.9
526-031a	Ground	220/17	55	0	2.6	0	20.2	22.8
526-031b	Ground	200/17	55	0	0	0	4.8	4.8
526-041	Ground	220/16	55	12.7	8	0	2.3	23
526-090a	Ground	240/16	90	0	0.1	0	9.4	9.5
526-096	Ground	240/16	97	7	20	0	0.3	27.3
526-111	Skyline	240/18	-	0	8	0	0	8
526-146	Ground	320/10	88	0	17.1	0	0	17.1
526-197	Endline	320/10	-	0	9	0	0	9

Harvest Unit	Method	Basal Area / QMD	Est Age	Dispersal	Forage	Nest/Roost	Non-Habitat	Grand Total
527-012	Ground	160/15	50	0	7.3	0	14.7	22
527-029	Ground	180/14	55	0	0	0	8.5	8.5
527-081	Ground	240/-	-	0	11	0	3.2	14.2
527-082	Ground	240/-	-	0	3.6	0	0	3.6
524-053*	Ground	280/-	101	0	3.6	0	0	3.6
524-054*	Ground	240/18	131	0	33.5	0	0	33.5
524-055*	Ground	330/12	-	0	51.2	0	0.3	51.5
526-013*	Ground	300/12	90	0	20.9	0	2.2	23.2
526-064*	Ground	230/-	125	0	41.7	0	8.6	50.3
526-073*	Ground	290/13	95	12.1	14.8	0	1.1	28.1
526-076*	Ground	120/-	-	9.5	0	0	0.6	10.1
526-080*	Ground	170/-	-	0	9.3	0	0.3	9.6
526-085*	Skyline	220/11	129	1.2	17.8	0	0	19.1
526-086*	Skyline	380/-	-	0	38.2	0	0	38.2
526-088*	Skyline	300/16	95	0	24	0	1.7	25.7
526-089*	Ground	260-18	113	0	22.4	0	2.3	24.7
526-090b*	Ground	220/16	111	0	36.5	0	0.9	37.5
526-097*	Ground	260/-	-	0	8.5	0	0	8.5
526-098B*	Ground	200/21	-	5.1	66.2	0	1.1	72.6
526-103*	Ground	200/17	125	0	4.1	0	8.5	12.5
526-104*	Ground	190/21	116	0	14.6	0	5.7	20.3
526-106*	Skyline	200/14	116	0	1.8	0	0	1.8
526-109*	Skyline	330/17	-	0	47.7	0	3.8	51.5
526-110*	Ground	230/12	97	0	22.5	0	0	22.5
526-113*	Ground	230/12	95	0	5.1	0	0.2	5.3
526-418*	Ground	230/-	-	0	17.9	0	0	17.9
526-098A*	Skyline	240/16	90	0	28.1	0	0	28.1
527-150*	Ground	260/-	-	0	28.3	0	0.6	28.9
Grand Total				60.5	672	0	151.3	884.3

*Units in Alternative 3 that have skip areas at 25% ranging from ¼ acre to two acres in size.

Pre-Commercial Thin (about 1,190 acres):

Plantations established between the 1960's thru the 1990's would be pre-commercially thinned. This will include some pre-commercial thinning in small patch cut areas surrounded by a mosaic

of natural stands that include 44.1 acres of foraging habitat. In areas where there are healthy, vigorous trees nearby, these smaller stems would be removed. Target Stand Density Index would remain below 230 to preclude inter-tree competition induced mortality. The incidence of disease would be low. Hardwoods would be encouraged. A variety of methods to treat the fuels generated including whole tree yarding, hand piling and pile burning or underburning. In stands where offsite stock was planted retaining naturally regenerated conifers will be chosen for retention and wider spacing incorporated to retain those trees that have the potential to achieve the desired sizes for late successional old growth stands.

The proposed treatment for stands emphasizes reduction of present stocking levels to enhance development of mid-mature and younger residual stems and increase the longevity of the mature stems that may be present. Conifers that have seeded in naturally particularly in areas planted with offsite stock, would be retained to enhance species diversity and genetic compatibility. Included in this treatment is biomass reduction to improve current and future stand resiliency to wildfire.

A thinning would remove trees in several size classes but the majority of the stems to be cut would be in the smaller diameters. Most hardwoods would be retained and their growth enhanced by thinning more heavily around them. The stands would have the Douglas-fir favored for retention. White fir would be the least desirable species to retain, particularly below 5,000 feet in elevation. Individual large trees would be cultured by removing most of the surrounding trees that are competing for moisture and sunlight.

After treatment the average tree diameter would be 5% larger than if left untreated. As many as 5 snags per acre, >15" in diameter would be retained. There currently is a snag deficit in this group. Particularly because trees that are dying seldom large enough to meet the Klamath LRMP snag guidelines.

Reduced stocking densities would preclude inter-tree competition induced mortality for approximately the next thirty years. Loss of hardwoods from the existing stands would be reduced. Spacing will be somewhat variable depending on species, aspect, site quality, and slope position. The ground and ladder fuels cut are less than 12 inches in diameter and will be treated through one of the methods listed below:

- Mechanical mastication (about 335 acres)
- Remaining acres of pre-commercial thin units will be a combination of (about 982 acres):
- Lop and scatter
- Hand thinning and piling (follow-up pile burn)
- Removal to a designated disposal area for burning or chipping

The pre-commercial thinning prescription in foraging habitat will retain foraging character after treatment. Pre-commercial thinning improves forage, forest health conditions, and reduces fuels. Many stands currently have a young component of overstocked trees that are growing and developing slowly due to inter-tree competition. Thinning these areas will increase growth to provide for larger trees in a shorter period of time. Pre-commercial thinning is expected to degrade 44.1 acres of foraging habitat. No downgrading or removal of foraging habitat will occur. Table A-2 shows the NSO suitable habitat within proposed pre-commercial thin units.

Table A-2: NSO habitat by pre-commercial thin treatment unit

Precommercial Thin Units	Dispersal	Forage	Nest/Roost	Non-Habitat	Grand Total
524-003	0	0	0	19	19
524-004	0	0	0	8.2	8.2
524-005	0	0	0	15.4	15.4
524-009	0	0	0	7.7	7.7
524-011	0	0	0	10.8	10.8
524-016	0	0	0	10.4	10.4
524-021	0	0	0	5.2	5.2
524-023	0	0	0	2.4	2.4
524-026	0	0	0	9.6	9.6
524-027	0	0	0	5.8	5.8
524-033	0	0	0	12.7	12.7
524-037	0	0	0	16.7	16.7
524-038	0	0	0	3.2	3.2
524-068	0	0	0	1.3	1.3
524-071	0	10.4	0	0	10.4
524-089	0	0	0	18.1	18.1
524-090	0	0	0	16.6	16.6
526-001	0	0	0	47.4	47.4
526-003	0	0	0	11	11
526-004	0	0	0	32.2	32.2
526-010	0	0	0	7.1	7.1
526-019a	0	0	0	3	3
526-023	0	0	0	14.5	14.5
526-025	4.8	0	0	0	4.8
526-026	38.2	0	0	7.1	38.2
526-028	0	0	0	6.8	6.8
526-032	0	0	0	4.6	4.6
526-034	0	0	0	28.5	28.5
526-037	0	0	0	2.6	2.6
526-038	0	0	0	14.7	14.7
526-039	0	0	0	1.8	1.8
526-040	0	0	0	2	2
526-043	0	0	0	6.7	6.7
526-044	0	0	0	8.3	8.3
526-045	0	0	0	9.8	9.8
526-049	0	2.7	0	0	2.7
526-052	0	1.3	0	0	1.3
526-059	0	6.9	0	0	6.9
526-063	0	3.9	0	0	3.9
526-065	0	0	0	3.1	3.1

526-066	0	0	0	7.3	7.3
526-069	0	0	0	7.6	7.6
526-074	0	0	0	9	9
526-084	0	0	0	8.7	8.7
526-091	0	0	0	8.4	8.4
526-092	0	0	0	7.5	7.5
526-100	0	0	0	1.8	1.8
526-101	0	0	0	19.9	19.9
526-102	0	0	0	8.6	8.6
526-114	0	0	0	8.7	8.7
526-124	0	0	0	4.1	4.1
526-126	3.6	0	0	0	3.6
526-127	0	0	0	12.2	12.2
526-130	0	0	0	8.9	8.9
526-143	0	0	0	4	4
527-001	0	0	0	8.1	8.1
527-002	0	0	0	4.9	4.9
527-003	0	0	0	21.8	21.8
527-004	0	0	0	5.5	5.5
527-005	0	0	0	17.9	17.9
527-008	0	0	0	20.3	20.3
527-009	4.3	0	0	0	4.3
527-010	0	0	0	22.4	22.4
527-013	0	0	0	16.4	16.4
527-014	0	0	0	9.6	9.6
527-015	0	0	0	40.4	40.4
527-017	0	0	0	11.1	11.1
527-018	0	0	0	6.2	6.2
527-019	0	0	0	9.1	9.1
527-022	0	0	0	8.4	8.4
527-023	0	0	0	6.1	6.1
527-024	0	0	0	10.5	10.5
527-025	9.2	0	0	0.2	9.4
527-026	0	0	0	22.2	22.2
527-028	0	0	0	9.5	9.5
527-035	0	1.9	0	10.1	12
527-036	0	0	0	2.6	2.6
527-041	0	0	0	7.1	7.1
527-044	0	0	0	4.7	4.7
527-045	0	0	0	9.6	9.6
527-046	0	0	0	20.5	20.5
527-049	0	0	0	9.9	9.9
527-050	0	0	0	9.5	9.5

527-051	0	0	0	13.8	13.8
527-052	0	0	0	12.8	12.8
527-054	0	0	0	16.8	16.8
527-058	0	0	0	24.6	24.6
527-061	0	0	0	7.9	7.9
527-062	0	0	0	3.2	3.2
527-064	0	0	0	25.7	25.7
527-070	0	0	0	5	5
527-073	0	0	0	4.1	4.1
527-075	0	0	0	2.3	2.3
527-083	0	0	0	10.9	10.9
527-100	0	0	0	21.9	21.9
527-103	0	0	0	6.5	6.5
527-106	0	0	0	15	15
527-120	5.8	0	0	0	5.8
527-122	5	0	0	0	5
527-131	0	0	0	14.9	14.9
527-132	0	0	0	2.5	2.5
527-133	0	0	0	16.5	16.5
527-134	4.7	17	0	1.6	23.4
528-003	0	0	0	11.7	11.7
528-013	0	0	0	1.4	1.4
528-027	0	0	0	11.5	11.5
528-030	0	0	0	9	9
528-031	0	0	0	13.6	13.6
Grand Total	70.6	44.1	0	1075.1	1189.8

Fuels Treatments (about 2,478 acres)

In addition to commercial harvest, pre-commercial thinning, and roadside hazard treatments described in this proposed action, hazardous fuel treatments will further reduce the dangers associated with heavy fuel loading, especially within the wildland urban interface. Fuels treatments will occur in 5 categories; Wildland Urban Interface Treatments, Lover's Camp Fuels Unit, Strategic Ridgeline Fuel Break, Roadside Fuels Treatments, and Prescribed Underburn Treatments. Hazardous fuels treatments may occur in Riparian Reserves. These treatments were developed using the criteria listed below and include: lop and scattering, chipping, mastication, broadcast burning, jackpot burning, and thinning and pilling with follow-up pile burning.

Criteria:

- Confined to areas determined to be feasible in terms of slope, accessibility, existing fuels conditions, and logical holding features such as roads, streams, and ridges.
- Focus on treatments within 0.25 mile from private property.
- Focus on protecting infrastructure including but not limited to utility lines, communication sites, campgrounds, and bridges.

- Treatment would occur within 250 feet on either side of strategic Forest roads and ridgelines.

Information on how each fuels treatment will be implemented is described in detail below. These descriptions are categorized based on type of treatment or the location within the project area. Description of treatments within the wildland urban interface, fuel breaks (roadside and ridgeline), and in areas proposed for prescribed burning are provided below.

Wildland Urban Interface (about 158 acres): A combination of mechanical, mastication, and hand work is proposed within the wildland urban interface areas of the project. Areas identified for treatment with mechanical equipment will include a combination of cutting trees and other understory vegetation. After mechanical or mastication treatments, activity generated slash will be piled and burned. Areas treated only by hand thinning will remove dead vegetation or trees under 12 inches in diameter and will be disposed of by chipping, piling with follow-up burning. Live understory vegetation (less than 12 inches in diameter) will be removed to reduce flame length, intensity, and the potential for crown fire activity. The objective is to have an area with a reduced fuel load and minimized ladder fuels to create a more defensible wildland urban interface during future fire events. Where commercial harvest units and wildland urban interface treatments overlap, commercial harvest will occur first followed by fuels treatments as described above. Table A-3 shows the NSO suitable habitat within proposed WUI fuel break units.

Table A-3: NSO habitat by WUI fuel break treatment unit

WUI Fuel Break Units	Dispersal	Forage	Nest/Roost	Non-Habitat	Grand Total
524-101	0	11	0	0	11
524-102	0	40	0	0	40
526-199	11	73	18	5	107
Grand Total	11	125	18	5	158

Lover's Camp Fuels Treatment Unit (about 36 acres): This fuels treatment will be conducted with hand work is proposed within an area that is adjacent to the Lover's Camp trailhead. The area will be treated by hand thinning. Dead vegetation or trees under 12 inches in diameter and will be disposed of by chipping, piling with follow-up burning. Live understory vegetation (less than 12 inches in diameter) will be removed to reduce flame length, intensity, and the potential for crown fire activity. The objective is to have an area with a reduced fuel load and minimized ladder fuels to create a more defensible wildland urban interface during future fire events. Table A-4 shows the NSO suitable habitat within the proposed Lover's Camp fuel break unit.

Table A-4: NSO habitat in Lover's Camp fuel break treatment unit

Fuel Break Unit	Dispersal	Forage	Nest/Roost	Non-Habitat	Grand Total
526-144	36	0	0	0	36

Strategic Ridgeline Fuelbreak (about 37 acres): There is one ridgeline treatment planned that is parallel to forest road 44N55 from Box Camp saddle down to private property, approximately 1 mile in length. Treatment in on this strategic ridgeline would remove all dead vegetation and live

brush greater than two feet tall, and by thinning live conifer trees less than 12 inches in diameter at breast height to approximately 20-foot spacing. Hardwoods would be retained.

Retained conifers will be pruned up to seven feet above the ground within these zones to increase canopy base height, and reduce ladder fuels and the potential for crown fire initiation. Activity generated fuels will be treated by a variety of methods. Where hand thinning is proposed, lopping and scattering of fuels, piling and burning, and/or chipping will be used to reduce fuels.

Mechanical or mastication equipment may be used to pile activity fuels within these areas in addition to, or in lieu of hand work. This treatment type is not occurring within nesting/roosting habitat for the northern spotted owl. Table A-5 shows the NSO suitable habitat within the proposed ridgetop fuel break unit.

Table A-5: NSO habitat by ridgetop fuel break treatment unit

Ridgetop Fuel Break Unit	Dispersal	Forage	Nest/Roost	Non-Habitat	Grand Total
526-193	2	13	0	22	37
Grand Total	2	13	0	22	37

Roadside Fuels Treatments (about 60 acres): Treatments along strategic roads will help to hold a planned or unplanned fire within the project area. Roadside treatments that were identified as strategic road systems for ingress/egress in accordance with the Lower Scott River Community Wildfire Protection Plan will include removal of activity generated fuels to provide access for fire suppression resources responding to future unplanned ignitions. Treatments would decrease ladder fuels, break up the continuity of fuels over the large landscape, provide areas of reduced fuels surrounding patches of suitable northern spotted owl habitat, and provide anchor points for future fuels treatments (such as surrounding prescribed fire). Roadside fuels treatments will vary in size and depth depending on fuel arrangements but generally will include thinning (non-commercial), hand piling, hazard tree removal, and pile burning along a maximum 250 foot buffer on both sides of the road. Widths of the roadside treatments will be variable and could be as little as 50 feet wide in some areas where fuels are light. Treatments within the treatment buffer will not be uniform and are expected to continue to provide high vegetative diversity after treatment. Hazard trees will be removed; small diameter conifers (less than 12 inches dbh) and ladder fuels will be cut and piled and follow up burning will occur. Where there is overlap between roadside fuels treatments and commercial harvest units more canopy modification will occur as part of the thinning prescription for that unit. Table A-6 shows the NSO suitable habitat within the proposed roadside fuel break units.

Where roadside fuels treatments overlap with northern spotted owl nesting/roosting habitat the following treatment restrictions will be followed:

- Roadside fuels treatments will be within 200 feet on either side of the road.
- Only conifers less than 6 inches dbh will be thinned and to a 20 foot or less spacing.
- Retain all hardwoods
- In order to maintain a mosaic of habitat types after treatment there will be patches of untreated understory.

- Trees that contribute to overstory canopy will not be removed, unless it meets the definition of a hazard tree.
- A seasonal restriction will apply between February 1 and July 9 for thinning, hand piling, and burning of piles.

Table A-6: NSO habitat by roadside fuel break treatment unit

Roadside Fuel Treatment Unit	Dispersal	Forage	Nesting and Roosting	Non-Habitat	Grand Total
526-198	0	22	2	0	24
Grand Total	0	22	2	0	24

Prescribed Burn (about 2,223 acres): Prescribed burning is proposed under weather conditions which promote low-intensity fires. Generally, fuels treatments will be implemented within 3 to 5 years after silviculture treatments have been implemented. There is no expected change in canopy closure beyond 5 percent after implementation. A mosaic post-burn condition will result from prescribed burning with isolated pockets of tree mortality, and burned and unburned understory vegetation. A mosaic burn is anticipated where some areas fully consume surface fuels and other areas are partially burned or unburned. These treatments will re-introduce fire to the project area under prescribed conditions that will reduce stands down toward low to mixed-severity fire conditions. Benefits of these actions include fuels reduction and vegetation diversity. Some nesting/roosting habitat does occur within proposed under burn areas. The objective for these blocks is to help reduce the chance of negative effects of unplanned ignitions and to maintain late-successional conditions. Under burning is proposed in 390 acres of silvicultural stands where these stands overlap with the planned burn blocks, this will treat pre- and post-harvest fuels. These areas were also designed to work synergistically with the silvicultural treatments and fuel breaks proposed. In the case of overlapping treatments, prescribed burning will be the last treatment to be implemented. As a result of burning there will be no more than a 5 percent loss of total crown closure in suitable northern spotted owl habitat overall. Effects of mosaic burns may result in small openings created from crown burned individual trees or small groups of trees less than 12 inches. Crown closure of stands will not go below 60 percent in northern spotted owl nesting/roosting habitat or 40 percent in northern spotted owl foraging habitat (this includes hardwood, subdominant, and dominant tree component over 15 feet).

Second entry burns in units identified for prescribed burning will be used to maintain surface fuel loading and increase heterogeneity of forest structure and vegetation by consuming surface fuels and small understory vegetation. Many of the prescribed burning locations will use existing control lines established in recent large fires within the project area. Fire lines will be constructed around the perimeter of the prescribed burn and will include using dozers to re-scrape control lines to mineral soil. Natural barriers to fire such as rock outcrops or talus would be used where they exist. In areas where control lines are not accessible by equipment, hand-line construction to mineral soil will occur. Removal of understory vegetation along control lines will include cutting brush and conifer trees less than 12 inches in diameter to facilitate holding operations during prescribed fire implementation. Table A-7 shows the NSO suitable habitat within the proposed underburn units.

Table A-7: NSO habitat by underburn fuel break treatment unit

Prescribed Underburn Units	Dispersal	Forage	Nesting or Roosting	Non-Habitat	Grand Total
524-100	0	332	154	83	569
526-195	17	206	6	67	296
526-196	42	820	142	354	1,358
Grand Total	60	1,357	302	504	2,223

Treatment of Activity Generated Fuels: Where treatments do not overlap with proposed prescribed burn activities the activity generated fuel will be treated by variety of methods including whole tree yarding, hand piling and pile burning or underburning.

Connected Actions: As the project is proposing to enter previously managed stands, no new road construction is proposed. Existing National Forest Transportation System roads, existing roadbeds, and temporary roads will be used for project implementation. Existing roadbeds will also be used for temporary access where available, and then will be closed and hydrologically stabilized following unit treatments. No new temporary access roads will be created outside of harvest units. An estimated 10 segments of temporary road will be used totaling 1.15 miles, of that about 1.05 miles are on existing roadbeds.

The majority of skyline will be yarded to “continuous” landings, which are widened areas of existing road bed sufficient to facilitate operation of cable yarders and swing loaders. This project will utilize about 63 landings for ground based operations, ranging in size from one quarter to one acre in size. There will be about 19 new landings constructed. The remaining 44 landings will be on existing sites. New landings will not be constructed in Riparian Reserves or NSO suitable habitat.

Alternative 3

This alternative was developed in response to relevant issue 3 to address the concern regarding effects to areas identified as high value habitat for the northern spotted owl within the project area. Treatments in Alternative 3 are identical to Alternative 2 with the exception of the differences described below.

- For commercial treatment units that were identified as high value, the silvicultural prescription was altered as follows (630 acres of commercial treatment).
 - Increase the percent of skip areas to 25% (Alternative 2 incorporated 15% skip areas into the prescription).
 - Increase the potential size of skips to 2 acres in size (Alternative 2 had a maximum area of 1 acre for skips).

Increasing the percent and size of skip areas into the silvicultural prescriptions is expected to leave a higher level of structural diversity immediately post-treatment reducing the short-term effects to northern spotted owl habitat that is identified as high value. The focus of this alternative is on retaining higher value (more recently occupied) habitat while aiming to achieve long-term beneficial effects in areas that are not currently occupied to improve future site quality. This alternative was developed in accordance of Recovery Action 10 of the Revised Recovery Plan for

the Northern Spotted Owl (2011b) which recommends the conservation of spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population. This alternative reduces the intensity of treatment in locations identified as high value for the northern spotted owl from what was proposed in Alternative 2 and meets Recovery Action 10 in the Revised Recovery Plan. The key piece to this is locating these areas on the ground. Skip areas will be marked on the ground and on the implementation green cards. These will be tracked throughout the implementation time of the project.

Project Design Features

Thinning operations and fuels reduction activities have the potential to create noise and smoke above ambient levels, so the implementation of site specific temporal and or spatial project design features (PDFs) are proposed to minimize or avoid significant impacts from disturbance or direct effects to NSO (Tables 6 through 11 in section 2.2 of the environmental assessment).